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Nov. 23, 1899

THE

AMERICAN EPHEMERIS

AND

NAUTICAL ALMANAC

FOR THE YEAR

1900

FIRST EDITION

PUBLISHED BY AUTHORITY OF CONGRESS

WASHINGTON:
BUREAU OF EQUIPMENT.
1897.

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PREFACE.

While the general arrangement of the *American Ephemeris* remains substantially as it has been since the volume for 1882, certain changes have been introduced in the present volume which are sufficiently important to demand special notice. First, the constant of precession, for the epoch 1900.0, has been changed from 50.2638″ to 50.2482″; the constant of nutation for the same epoch has been changed from 9.2231″ to 9.21″; the constant of aberration has been changed from 20.4451″ to 20.47″; and the constant of solar parallax from 8.848″ to 8.80″. Second, Professor Newcomb's tables of the Sun, Mercury and Venus, and Dr. Hill's final printed (as distinguished from his provisional manuscript) tables of Saturn have been substituted for the tables which were formerly used. Third, the 175 additional fixed stars, whose apparent right ascensions only were heretofore given, have been transferred to the regular list, which now contains their complete apparent places throughout the year.

The Ephemeris is divided into three parts, as follows:—

Part I, *Ephemeris for the Meridian of Greenwich*, which gives the ephemerides of the Sun and Moon, the geocentric and heliocentric positions of the major planets, the Sun's co-ordinates, and other fundamental astronomical data, for equi-distant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, which gives the ephemerides of the fixed stars, Sun, Moon, and major planets for transit over the meridian of the new Naval Observatory, Washington. The mean places of the fixed stars and the data for their reduction are also included in this part.

Part III, *Phenomena*, which contains predictions of phenomena to be observed, with data for their computation. Washington mean time for the meridian of the new Naval Observatory is used throughout this part except in a few cases, notably those of eclipses, where Greenwich mean time seems more convenient.

Professor Simon Newcomb, U. S. N., was Director of the Almanac until March 11, 1897, and as the present volume was prepared under his supervision, he alone must be regarded as responsible for it. Professor W. W. Hendrickson, U. S. N., was Director from March 11 until June 30, 1897, and on the latter date I took charge of the office. At that time 396 pages of the volume were in type, and my connection with it has been limited to seeing the remainder of the work through the press.

WM. HARKNESS,
Professor of Mathematics, U. S. Navy,
Director Nautical Almanac.

Washington, *September, 1897.*

CONTENTS.

Page
Corrections vi
Chronological Eras and Cycles vii
Symbols and Abbreviations viii

PART I—*EPHEMERIS FOR THE MERIDIAN OF GREENWICH.*

Pages of Each Month
Ephemeris of the Sun . . . . . I—III
Ephemeris of the Moon . . . . . IV—XII
Phases of the Moon XII
Lunar Distances . . . . . XIII—XVIII
Page
Geocentric Ephemerides of the Planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune . 218
Heliocentric Ephemerides of the Planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune . 250
Sun's Co-ordinates 272
Moon's Longitude and Latitude 280
Moon's Equator, Mean Longitude, etc. 284
Moon's Libration; Sun's Aberration and Horizontal Parallax 285
Precession, Nutation, Obliquity, etc. 286
Nutation, Terms of Short Period in the 287

PART II—*EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.*

Bessel's Formulæ for Star-Reductions 289
Besselian Star-Numbers, *A*, *B*, *C*, *D* 290
Independent Star-Numbers, *f*, *g*, *h*, etc. 294
Mean Places of Standard Stars for 1900.0 302
Apparent Places of Four Circumpolar Stars 310
Apparent Places of remaining Standard Stars 322
Solar Ephemeris 398
Moon-Culminations 406
Transit-Ephemerides of the Planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune . 414

PART III—*PHENOMENA.*

Eclipses 431
Moon's Phases, Apogee, Perigee, and Greatest Libration 437
Mean Places of Stars Occulted by the Moon 438
Elements for the Prediction of Occultations 442
Occultations Visible at Washington 472
Disk of Mercury 474
Disk of Venus 475
Disk of Mars 476
Satellites of Jupiter 477
Satellites of Saturn 502
Rings of Saturn 505
Satellites of Uranus 506
Satellite of Neptune 507
Phenomena, Planetary Constellations 508
Positions of Observatories 510
On the Arrangement and Use of *The American Ephemeris and Nautical Almanac* 515

APPENDIX.

On the Construction of *The American Ephemeris and Nautical Almanac* for 1900 541

TABLES.

Table I.—Correction of Lunar Distances for Second Differences in Moon's Motion . . . 545
Table II.—Reduction of Sidereal to Mean Solar Time 546
Table III.—Reduction of Mean Solar to Sidereal Time 549
Table IV.—Latitude by Observation of the Altitude of Polaris 552

CORRECTIONS.

Ephemeris, 1898.

Page.

V, 19th line, *for* 1896.0 *read* 1898.0

57, Foot note, *for* south *read* north

75, Foot note, *for* decreasing *read* increasing

297, Declination of θ Virginis, *for* 5° 59′ 40″ 36 *read* 4° 59′ 40″.36

365, 2nd line from bottom of upper ½ page, Mean Solar date, *for* 34 2 *read* **24.2**

421, Declination of o^2 Cancri, *for* 16° 58′ 22″.30 *read* 15° 58′ 22″.30

423, *for* θ Sagittarii *read* o Sagittarii

423, Ann prop. motion in decl. of 51 Aquarii, *for* —0 002 *read* —0.020

463, 6th line, *for* 462—482 *read* 466—486

508, 5th line, *for* ″ ° ′ ″ *read* s h m s

521, 27th line from bottom, *for* log x *read* log x'

524, 21st line from top insert γ' before the symbol $<$

Ephemeris, 1899.

Page.

152, Moon's R. A. $9^d\ 7^h$, *for* $14^h\ 22^m\ 33^s.\ 8$ *read* $14^h\ 22^m\ 33^s.28$

293, Decl. of δ Hydri, *for* —96° 7′ 7″.94 *read* —69° 7′ 7″.94

315, Right hand column, bottom line, *for* +0.7 *read* —0.7

317, Bottom line, decl. of β Arietis, *for* 89.7 *read* 79 7

—, Chart of partial eclipse of June 7, 1899, *for* Japan *read* Saghalien

417, In column New Moon, insert, Dec. $31^d\ 20^h\ 43^m.6$

421, Ann prop motion in decl. of 51 Aquarii, *for* —0.002 *read* —0 020

520, 2nd line from bottom, Emersion, *for* 8.78518 *n* *read* 9.78518 *n*

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1900, WHICH COMPRISES THE LATTER PART OF THE 124TH AND THE BEGINNING OF THE 125TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6613th of the Julian Period;

" 7408–7409 of the Byzantine era, the year 7409 commencing on September 1st;

" 5660–5661 of the Jewish era, the year 5661 commencing on September 24th, or, more exactly, at sunset on September 23rd;

" 2653 since the foundation of Rome, according to VARRO;

" 2647 since the beginning of the era of NABONASSAR, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period; corresponding, in the notation of chronologists, to the 747th; and, in the notation of astronomers, to the 746th year before the birth of CHRIST;

" 2676 of the Olympiads, or the fourth year of the 669th Olympiad commencing in July, 1900, if we fix the era of the Olympiads at 775½ years before CHRIST, or near the beginning of July of the year 3938 of the Julian Period;

" 2212 of the Grecian era, or the era of the SELEUCIDÆ;

" 1616 of the era of DIOCLETIAN;

" 2560 of the Japanese era and to the 33d year of the period entitled "Meiji."

The year 1318 of the Mohammedan era, or the era of the Hegira, begins on the 1st day of May, 1900.

The first day of January of the year 1900 is the 2,415,021st day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	G	Solar Cycle	5
Epact	29	Roman Indiction	13
Lunar Cycle or Golden Number	1	Julian Period	6613

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
⊕	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs.	1.	♈	Aries.	Autumn Signs.	7.	♎	Libra.
	2.	♉	Taurus.		8.	♏	Scorpius.
	3.	♊	Gemini.		9.	♐	Sagittarius.
Summer Signs.	4.	♋	Cancer.	Winter Signs.	10.	♑	Capricornus.
	5.	♌	Leo.		11.	♒	Aquarius.
	6.	♍	Virgo.		12.	♓	Pisces.

ASPECTS.

☌ Conjunction, or having the same Longitude or Right Ascension.
□ Quadrature, or differing 90° in Longitude or Right Ascension.
☍ Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

☊	Ascending Node.	°	Degrees.
☋	Descending Node.	′	Minutes of Arc.
N.	North.	″	Seconds of Arc.
S.	South.	^{h}	Hours.
E.	East.	^{m}	Minutes of Time.
W.	West.	^{s}	Seconds of Time.

PART I

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF GREENWICH

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	18 46 24.30	11.045	S. 23 1 22.4	+12.24	16 17.13	71.00	3 40.24	1.190
Tues.	2	18 50 49.31	11.031	22 56 14.5	13.39	16 17.13	70.95	4 8.61	1.175
Wed.	3	18 55 13.97	11.015	22 50 39.3	14.53	16 17.12	70.90	4 36.63	1.159
Thur.	4	18 59 38.21	10.998	22 44 36.8	+15.66	16 17.11	70.85	5 4.26	1.141
Frid.	5	19 4 2.05	10.980	22 38 7.2	16.78	16 17.09	70.79	5 31.45	1.122
Sat.	6	19 8 25.42	10.961	22 31 10.9	17.89	16 17.07	70.73	5 58.19	1.103
SUN.	7	19 12 48.30	10.940	22 23 47.8	+19.00	16 17.05	70.66	6 24.44	1.082
Mon.	8	19 17 10.66	10.918	22 15 58.3	20.10	16 17.02	70.59	6 50.17	1.060
Tues.	9	19 21 32.49	10.895	22 7 42.7	21.19	16 16.98	70.52	7 15.37	1.037
Wed.	10	19 25 53.75	10.870	21 59 1.1	+22.26	16 16.94	70.45	7 39.99	1.014
Thur.	11	19 30 14.40	10.845	21 49 53.9	23.32	16 16.90	70.37	8 4.02	0.990
Frid.	12	19 34 34.46	10.819	21 40 21.3	24.38	16 16.85	70.29	8 27.47	0.964
Sat.	13	19 38 53.89	10.793	21 30 23.5	+25.42	16 16.80	70.20	8 50.27	0.937
SUN.	14	19 43 12.66	10.766	21 20 0.8	26.44	16 16.74	70.11	9 12.44	0.910
Mon.	15	19 47 30.78	10.738	21 9 13.6	27.46	16 16.67	70.02	9 33.95	0.882
Tues.	16	19 51 48.22	10.710	20 58 2.0	+28.47	16 16.60	69.93	9 54.77	0.854
Wed.	17	19 56 4.97	10.681	20 46 26.4	29.47	16 16.52	69.83	10 14.91	0.825
Thur.	18	20 0 21.02	10.651	20 34 27.2	30.45	16 16.44	69.73	10 34.36	0.795
Frid.	19	20 4 36.34	10.621	20 22 4.5	+31.42	16 16.36	69.63	10 53.08	0.765
Sat.	20	20 8 50.95	10.591	20 9 18.7	32.38	16 16.27	69.53	11 11.09	0.735
SUN.	21	20 13 4.81	10.560	19 56 10.2	33.32	16 16.18	69.43	11 28.33	0.704
Mon.	22	20 17 17.92	10.529	19 42 39.3	+34.24	16 16.08	69.33	11 44.85	0.672
Tues.	23	20 21 30.27	10.497	19 28 46.4	35.15	16 15.98	69.22	12 0.59	0.641
Wed.	24	20 25 41.86	10.465	19 14 31.9	36.05	16 15.87	69.11	12 15.58	0.609
Thur.	25	20 29 52.66	10.433	18 59 56.1	+36.93	16 15.75	69.00	12 29.80	0.577
Frid.	26	20 34 2.68	10.400	18 44 59.3	37.79	16 15.63	68.89	12 43.22	0.544
Sat.	27	20 38 11.92	10.367	18 29 42.0	38.63	16 15.51	68.78	12 55.86	0.511
SUN.	28	20 42 20.36	10.334	18 14 4.5	+39.46	16 15.38	68.66	13 7.70	0.478
Mon.	29	20 46 28.00	10.300	17 58 7.4	40.28	16 15.25	68.55	13 18.74	0.444
Tues.	30	20 50 34.80	10.266	17 41 51.0	41.08	16 15.11	68.43	13 28.97	0.410
Wed.	31	20 54 40.79	10.232	17 25 15.8	41.86	16 14.97	68.32	13 38.37	0.376
Thur.	32	20 58 45.95	10.198	S. 17 8 22.1	+42.62	16 14.83	68.20	13 46.97	0.341

Note.—The mean time of semidiameter passing may be found by subtracting $0^{s}.19$ from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	18 46 23.63	11.045	S. 23 1 23.1	+12.24	3 40.17	1.190	18 42 43.46
Tues.	2	18 50 48.55	11.031	22 56 15.4	13.39	4 8.53	1.175	18 46 40.02
Wed.	3	18 55 13.12	11.015	22 50 40.4	14.53	4 36.54	1.159	18 50 36.58
Thur.	4	18 59 37.28	10.998	22 44 38.1	+15.66	5 4.15	1.141	18 54 33.13
Frid.	5	19 4 1.04	10.980	22 38 8.7	16.78	5 31.35	1.122	18 58 29.69
Sat.	6	19 8 24.33	10.961	22 31 12.6	17.89	5 58.08	1.103	19 2 26.25
SUN.	7	19 12 47.13	10.940	22 23 49.8	+19.00	6 24.33	1.082	19 6 22.81
Mon.	8	19 17 9.41	10.918	22 16 0.6	20.10	6 50.05	1.060	19 10 19.36
Tues.	9	19 21 31.17	10.895	22 7 45.3	21.18	7 15.25	1.037	19 14 15.92
Wed.	10	19 25 52.36	10.870	21 59 4.0	+22.25	7 39.87	1.014	19 18 12.48
Thur.	11	19 30 12.94	10.845	21 49 57.1	23.31	8 3.90	0.990	19 22 9.04
Frid.	12	19 34 32.93	10.819	21 40 24.8	24.37	8 27.34	0.964	19 26 5.59
Sat.	13	19 38 52.30	10.793	21 30 27.3	+25.41	8 50.14	0.937	19 30 2.15
SUN.	14	19 43 11.01	10.766	21 20 4.9	26.43	9 12.30	0.910	19 33 58.71
Mon.	15	19 47 29.07	10.738	21 9 18.0	27.45	9 33.81	0.882	19 37 55.26
Tues.	16	19 51 46.45	10.710	20 58 6.7	+28.46	9 54.63	0.854	19 41 51.82
Wed.	17	19 56 3.15	10.681	20 46 31.4	29.46	10 14.77	0.825	19 45 48.38
Thur.	18	20 0 19.15	10.651	20 34 32.5	30.44	10 34.21	0.795	19 49 44.94
Frid.	19	20 4 34.42	10.621	20 22 10.1	+31.41	10 52.93	0.765	19 53 41.49
Sat.	20	20 8 48.98	10.591	20 9 24.7	32.37	11 10.94	0.735	19 57 38.05
SUN.	21	20 13 2.79	10.560	19 56 16.6	33.31	11 28.18	0.704	20 1 34.61
Mon.	22	20 17 15.86	10.529	19 42 46.1	+34.23	11 44.70	0.672	20 5 31.16
Tues.	23	20 21 28.17	10.497	19 28 53.5	35.14	12 0.45	0.641	20 9 27.72
Wed.	24	20 25 39.72	10.465	19 14 39.3	36.04	12 15.44	0.609	20 13 24.28
Thur.	25	20 29 50.49	10.433	19 0 3.8	+36.92	12 29.66	0.577	20 17 20.83
Frid.	26	20 34 0.48	10.400	18 45 7.4	37.78	12 43.09	0.544	20 21 17.39
Sat.	27	20 38 9.69	10.367	18 29 50.4	38.62	12 55.74	0.511	20 25 13.94
SUN.	28	20 42 18.10	10.334	18 14 13.3	+39.45	13 7.59	0.478	20 29 10.50
Mon.	29	20 46 25.71	10.300	17 58 16.5	40.27	13 18.64	0.444	20 33 7.06
Tues.	30	20 50 32.49	10.266	17 42 0.4	41.07	13 28.88	0.410	20 37 3.61
Wed.	31	20 54 38.46	10.232	17 25 25.4	41.85	13 38.29	0.376	20 41 0.17
Thur.	32	20 58 43.61	10.198	S. 17 8 31.9	+42.61	13 46.89	0.341	20 44 56.72

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing

Diff. for 1 Hour, $+9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	1	280 40 8.7	39 51.2	152.96	+ 0.26	9.9926699	− 0.6	5 16 24.56
2	2	281 41 20.1	41 2.3	152.96	0.40	9.9926694	+ 0.1	5 12 28.65
3	3	282 42 31.4	42 13.4	152.96	0.50	9.9926706	0.8	5 8 32.74
4	4	283 43 42.4	43 24.3	152.95	+ 0.59	9.9926734	+ 1.5	5 4 36.83
5	5	284 44 53.1	44 34.8	152.94	0.65	9.9926780	2.3	5 0 40.91
6	6	285 46 3.5	45 45.0	152.92	0.67	9.9926845	3.1	4 56 45.00
7	7	286 47 13.3	46 54.7	152.90	+ 0.65	9.9926929	+ 3.9	4 52 49.09
8	8	287 48 22.7	48 3.9	152.88	0.60	9.9927034	4.9	4 48 53.18
9	9	288 49 31.5	49 12.5	152.85	0.51	9.9927163	5.9	4 44 57.27
10	10	289 50 39.7	50 20.6	152.83	+ 0.42	9.9927317	+ 6.9	4 41 1.36
11	11	290 51 47.3	51 28.0	152.81	0.30	9.9927495	8.0	4 37 5.44
12	12	291 52 54.4	52 34.9	152.79	0.17	9.9927699	9.0	4 33 9.53
13	13	292 54 0.8	53 41.2	152.76	+ 0.04	9.9927930	+10.1	4 29 13.62
14	14	293 55 6.7	54 46.9	152.74	− 0.09	9.9928190	11.3	4 25 17.71
15	15	294 56 12.1	55 52.1	152.71	0.20	9.9928476	12.5	4 21 21.80
16	16	295 57 16.9	56 56.7	152.69	− 0.31	9.9928790	+13.6	4 17 25.89
17	17	296 58 21.2	58 0.9	152.67	0.39	9.9929131	14.8	4 13 29.98
18	18	297 59 25.0	59 4.5	152.65	0.45	9.9929500	15.9	4 9 34.07
19	19	299 0 28.3	0 7.7	152.63	− 0.48	9.9929894	+17.0	4 5 38.16
20	20	300 1 31.2	1 10.4	152.61	0.48	9.9930314	18.0	4 1 42.24
21	21	301 2 33.5	2 12.6	152.59	0.46	9.9930759	19.0	3 57 46.33
22	22	302 3 35.4	3 14.3	152.57	− 0.41	9.9931227	+20.0	3 53 50.42
23	23	303 4 36.7	4 15.5	152.54	0.34	9.9931719	20.9	3 49 54.51
24	24	304 5 37.5	5 16.1	152.52	0.23	9.9932232	21.8	3 45 58.60
25	25	305 6 37.8	6 16.2	152.50	− 0.11	9.9932765	+22.6	3 42 2.69
26	26	306 7 37.5	7 15.7	152.48	+ 0.02	9.9933316	23.4	3 38 6.78
27	27	307 8 36.5	8 14.6	152.45	0.15	9.9933886	24.1	3 34 10.87
28	28	308 9 34.8	9 12.8	152.42	+ 0.29	9.9934471	+24.7	3 30 14.96
29	29	309 10 32.4	10 10.2	152.38	0.44	9.9935071	25.3	3 26 19.05
30	30	310 11 29.0	11 6.7	152.34	0.55	9.9935684	25.8	3 22 23.14
31	31	311 12 24.7	12 2.2	152.30	0.63	9.9936309	26.3	3 18 27.23
32	32	312 13 19.2	12 56.6	152.25	+ 0.68	9.9936948	+26.9	3 14 31.32

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January 0.^{d}0.

Diff. for 1 Hour,
—9^s.8296.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 19.6	16 23.4	59 48.5	+1.33	60 2.8	+1.05	☌		29.5
2	16 26.4	16 28.3	60 13.6	0.75	60 20.7	+0.44	0 57.9	2.43	0.9
3	16 29.2	16 29.2	60 24.1	+0.13	60 23.8	−0.17	1 55.0	2.33	1.9
4	16 28.1	16 26.2	60 20.0	−0.45	60 13.0	−0.70	2 49.6	2.22	2.9
5	16 23.6	16 20.2	60 3.2	0.92	59 50.9	1.10	3 41.9	2.14	3.9
6	16 16.3	16 12.0	59 36.7	1.25	59 20.9	1.36	4 32.8	2.10	4.9
7	16 7.4	16 2.6	59 4.0	−1.44	58 46.4	−1.48	5 23.1	2.10	5.9
8	15 57.7	15 52.8	58 28.4	1.50	58 10.2	1.50	6 13.9	2.13	6.9
9	15 47.9	15 43.1	57 52.2	1.49	57 34.5	1.46	7 5.6	2.18	7.9
10	15 38.4	15 33.8	57 17.2	−1.43	57 0.3	−1.38	7 58.5	2.22	8.9
11	15 29.3	15 25.0	56 44.0	1.34	56 28.2	1.29	8 52.2	2.24	9.9
12	15 20.9	15 16.9	56 13.0	1.24	55 58.4	1.19	9 45.8	2.22	10.9
13	15 13.1	15 9.5	55 44.4	−1.14	55 31.1	−1.09	10 38.4	2.16	11.9
14	15 6.0	15 2.7	55 18.3	1.03	55 6.2	0.98	11 29.1	2.06	12.9
15	14 59.6	14 56.7	54 54.8	0.92	54 44.2	0.85	12 17.2	1.95	13.9
16	14 54.1	14 51.7	54 34.5	−0.77	54 25.7	−0.68	13 2.7	1.85	14.9
17	14 49.6	14 47.9	54 18.1	0.58	54 11.8	0.47	13 46.1	1.76	15.9
18	14 46.5	14 45.6	54 6.9	0.34	54 3.5	−0.21	14 27.8	1.71	16.9
19	14 45.2	14 45.2	54 1.9	−0.06	54 2.1	+0.10	15 8.5	1.69	17.9
20	14 45.9	14 47.1	54 4.4	+0.28	54 8.8	0.46	15 49.3	1.71	18.9
21	14 48.9	14 51.4	54 15.5	0.65	54 24.6	0.85	16 30.9	1.76	19.9
22	14 54.5	14 58.3	54 36.1	+1.06	54 50.1	+1.27	17 14.3	1.86	20.9
23	15 2.8	15 7.9	55 6.5	1.48	55 25.4	1.67	18 0.4	1.99	21.9
24	15 13.7	15 20.0	55 46.5	1.85	56 9.9	2.02	18 49.8	2.14	22.9
25	15 26.9	15 34.2	56 35.1	+2.17	57 1.9	+2.29	19 43.0	2.29	23.9
26	15 41.8	15 49.7	57 30.0	2.37	57 58.8	2.41	20 39.5	2.42	24.9
27	15 57.6	16 5.4	58 27.8	2.40	58 56.4	2.34	21 38.5	2.49	25.9
28	16 12.9	16 19.9	59 23.9	+2.22	59 49.6	+2.04	22 38.3	2.48	26.9
29	16 26.2	16 31.6	60 12.8	1.81	60 32.8	1.52	23 37.3	2.43	27.9
30	16 36.0	16 39.3	60 49.0	1.18	61 0.9	+0.80	☌		28.9
31	16 41.3	16 41.9	61 8.2	+0.40	61 10.6	0.00	0 34.5	2.34	0.4
32	16 41.3	16 39.4	61 8.3	−0.39	61 1.3	−0.75	1 29.8	2.26	1.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 1.					WEDNESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 41 18.93	2.5663	S.21 21 46.9	5.707	0	20 41 19.86	2.4125	S.14 12 54.5	11.677
1	18 43 52.87	2.5649	21 16 0.0	5.857	1	20 43 44.49	2.4084	14 1 11.2	11.766
2	18 46 26.72	2.5633	21 10 4.0	6.007	2	20 46 8.87	2.4042	13 49 22.6	11.854
3	18 49 0.47	2.5617	21 3 59.2	6.155	3	20 48 33.00	2.4001	13 37 28.7	11.941
4	18 51 34.12	2.5598	20 57 45.4	6.303	4	20 50 56.88	2.3960	13 25 29.7	12.026
5	18 54 7.65	2.5579	20 51 22.8	6.450	5	20 53 20.52	2.3919	13 13 25.6	12.109
6	18 56 41.07	2.5560	20 44 51.4	6.596	6	20 55 43.91	2.3877	13 1 16.6	12.191
7	18 59 14.37	2.5540	20 38 11.3	6.742	7	20 58 7.05	2.3837	12 49 2.7	12.271
8	19 1 47.55	2.5518	20 31 22.4	6.887	8	21 0 29.95	2.3797	12 36 44.1	12.349
9	19 4 20.59	2.5495	20 24 24.9	7.029	9	21 2 52.61	2.3756	12 24 20.8	12.426
10	19 6 53.49	2.5471	20 17 18.9	7.172	10	21 5 15.02	2.3714	12 11 53.0	12.500
11	19 9 26.24	2.5447	20 10 4.3	7.314	11	21 7 37.18	2.3673	11 59 20.8	12.573
12	19 11 58.85	2.5422	20 2 41.2	7.455	12	21 9 59.10	2.3633	11 46 44.2	12.645
13	19 14 31.30	2.5395	19 55 9.7	7.595	13	21 12 20.78	2.3594	11 34 3.4	12.715
14	19 17 3.59	2.5367	19 47 29.8	7.733	14	21 14 42.23	2.3554	11 21 18.4	12.783
15	19 19 35.71	2.5340	19 39 41.7	7.871	15	21 17 3.43	2.3514	11 8 29.3	12.850
16	19 22 7.67	2.5312	19 31 45.3	8.007	16	21 19 24.40	2.3475	10 55 36.3	12.915
17	19 24 39.45	2.5282	19 23 40.8	8.142	17	21 21 45.13	2.3436	10 42 39.5	12.978
18	19 27 11.06	2.5252	19 15 28.2	8.277	18	21 24 5.63	2.3398	10 29 38.9	13.040
19	19 29 42.48	2.5222	19 7 7.6	8.410	19	21 26 25.90	2.3359	10 16 34.7	13.100
20	19 32 13.72	2.5190	18 58 39.0	8.542	20	21 28 45.94	2.3321	10 3 26.9	13.158
21	19 34 44.76	2.5157	18 50 2.5	8.673	21	21 31 5.75	2.3282	9 50 15.7	13.215
22	19 37 15.61	2.5125	18 41 18.2	8.802	22	21 33 25.33	2.3245	9 37 1.1	13.270
23	19 39 46.26	2.5092	S.18 32 26.2	8.930	23	21 35 44.69	2.3208	S. 9 23 43.3	13.323
	TUESDAY 2.					THURSDAY 4.			
0	19 42 16.71	2.5057	S.18 23 26.6	9.057	0	21 38 3.83	2.3172	S. 9 10 22.3	13.375
1	19 44 46.95	2.5023	18 14 19.4	9.183	1	21 40 22.75	2.3135	8 56 58.3	13.424
2	19 47 16.99	2.4988	18 5 4.6	9.308	2	21 42 41.45	2.3098	8 43 31.4	13.472
3	19 49 46.81	2.4952	17 55 42.4	9.431	3	21 44 59.93	2.3063	8 30 1.6	13.520
4	19 52 16.41	2.4916	17 46 12.9	9.552	4	21 47 18.21	2.3028	8 16 29.0	13.565
5	19 54 45.80	2.4880	17 36 36.1	9.672	5	21 49 36.27	2.2992	8 2 53.8	13.608
6	19 57 14.97	2.4842	17 26 52.1	9.791	6	21 51 54.12	2.2958	7 49 16.1	13.650
7	19 59 43.91	2.4805	17 17 1.1	9.909	7	21 54 11.77	2.2925	7 35 35.8	13.691
8	20 2 12.63	2.4767	17 7 3.0	10.026	8	21 56 29.22	2.2891	7 21 53.2	13.728
9	20 4 41.11	2.4728	16 56 58.0	10.140	9	21 58 46.46	2.2857	7 8 8.4	13.765
10	20 7 9.37	2.4691	16 46 46.2	10.252	10	22 1 3.51	2.2826	6 54 21.4	13.801
11	20 9 37.40	2.4652	16 36 27.7	10.364	11	22 3 20.37	2.2793	6 40 32.3	13.834
12	20 12 5.19	2.4612	16 26 2.5	10.474	12	22 5 37.03	2.2761	6 26 41.3	13.866
13	20 14 32.74	2.4572	16 15 30.8	10.583	13	22 7 53.51	2.2731	6 12 48.4	13.897
14	20 17 0.06	2.4533	16 4 52.5	10.691	14	22 10 9.80	2.2700	5 58 53.7	13.926
15	20 19 27.14	2.4492	15 54 7.9	10.796	15	22 12 25.91	2.2670	5 44 57.3	13.952
16	20 21 53.97	2.4452	15 43 17.0	10.900	16	22 14 41.84	2.2641	5 30 59.4	13.978
17	20 24 20.56	2.4412	15 32 19.9	11.002	17	22 16 57.60	2.2612	5 16 59.9	14.003
18	20 26 46.91	2.4372	15 21 16.7	11.103	18	22 19 13.18	2.2582	5 2 59.0	14.025
19	20 29 13.02	2.4331	15 10 7.5	11.202	19	22 21 28.59	2.2555	4 48 56.9	14.045
20	20 31 38.88	2.4290	14 58 52.4	11.301	20	22 23 43.84	2.2528	4 34 53.6	14.065
21	20 34 4.50	2.4249	14 47 31.4	11.397	21	22 25 58.93	2.2502	4 20 49.1	14.083
22	20 36 29.87	2.4207	14 36 4.7	11.492	22	22 28 13.86	2.2475	4 6 43.6	14.099
23	20 38 54.99	2.4166	14 24 32.4	11.585	23	22 30 28.63	2.2448	3 52 37.2	14.114
24	20 41 19.86	2.4125	S.14 12 54.5	11.677	24	22 32 43.24	2.2423	S. 3 38 29.9	14.127

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 5.					SUNDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 32 43.24	2.2423	S. 3 38 29.9	14.127	0	0 18 35.75	2.1922	N. 7 27 38.9	13.117
1	22 34 57.71	2.2399	3 24 21.9	14.139	1	0 20 47.29	2.1925	7 40 44.4	13.065
2	22 37 12.03	2.2375	3 10 13.2	14.149	2	0 22 58.85	2.1929	7 53 46.7	13.011
3	22 39 26.21	2.2352	2 56 4.0	14.157	3	0 25 10.44	2.1934	8 6 45.7	12.957
4	22 41 40.25	2.2329	2 41 54.3	14.164	4	0 27 22.06	2.1939	8 19 41.5	12.902
5	22 43 54.16	2.2307	2 27 44.3	14.170	5	0 29 33.71	2.1945	8 32 33.9	12.844
6	22 46 7.94	2.2285	2 13 33.9	14.175	6	0 31 45.40	2.1952	8 45 22.8	12.787
7	22 48 21.58	2.2264	1 59 23.3	14.178	7	0 33 57.13	2.1958	8 58 8.3	12.728
8	22 50 35.11	2.2244	1 45 12.6	14.178	8	0 36 8.90	2.1966	9 10 50.2	12.668
9	22 52 48.51	2.2223	1 31 1.8	14.178	9	0 38 20.72	2.1974	9 23 28.5	12.607
10	22 55 1.79	2.2204	1 16 51.1	14.177	10	0 40 32.59	2.1982	9 36 3.0	12.544
11	22 57 14.96	2.2185	1 2 40.5	14.174	11	0 42 44.50	2.1990	9 48 33.8	12.482
12	22 59 28.01	2.2167	0 48 30.2	14.169	12	0 44 56.47	2.1999	10 1 0.8	12.418
13	23 1 40.96	2.2150	0 34 20.2	14.163	13	0 47 8.49	2.2009	10 13 23.9	12.352
14	23 3 53.81	2.2133	0 20 10.6	14.156	14	0 49 20.58	2.2019	10 25 43.0	12.286
15	23 6 6.56	2.2117	S. 0 6 1.5	14.147	15	0 51 32.72	2.2029	10 37 58.2	12.218
16	23 8 19.22	2.2102	N. 0 8 7.0	14.137	16	0 53 44.93	2.2040	10 50 9.2	12.149
17	23 10 31.78	2.2087	0 22 14.9	14.126	17	0 55 57.20	2.2052	11 2 16.1	12.080
18	23 12 44.26	2.2072	0 36 22.1	14.112	18	0 58 9.55	2.2063	11 14 18.8	12.009
19	23 14 56.65	2.2058	0 50 28.4	14.097	19	1 0 21.96	2.2075	11 26 17.2	11.937
20	23 17 8.96	2.2046	1 4 33.8	14.082	20	1 2 34.45	2.2087	11 38 11.3	11.865
21	23 19 21.20	2.2033	1 18 38.2	14.065	21	1 4 47.01	2.2100	11 50 1.0	11.792
22	23 21 33.36	2.2021	1 32 41.6	14.047	22	1 6 59.65	2.2113	12 1 46.3	11.717
23	23 23 45.45	2.2010	N. 1 46 43.8	14.087	23	1 9 12.36	2.2126	N.12 13 27.2	11.641
	SATURDAY 6.					MONDAY 8.			
0	23 25 57.48	2.2000	N. 2 0 44.8	14.006	0	1 11 25.16	2.2140	N.12 25 3.3	11.563
1	23 28 9.45	2.1989	2 14 44.5	13.983	1	1 13 38.04	2.2154	12 36 34.8	11.487
2	23 30 21.35	2.1979	2 28 42.8	13.959	2	1 15 51.01	2.2168	12 48 1.7	11.408
3	23 32 33.20	2.1971	2 42 39.6	13.934	3	1 18 4.06	2.2183	12 59 23.8	11.327
4	23 34 45.00	2.1963	2 56 34.9	13.907	4	1 20 17.21	2.2198	13 10 41.0	11.247
5	23 36 56.76	2.1956	3 10 28.5	13.880	5	1 22 30.44	2.2213	13 21 53.4	11.166
6	23 39 8.47	2.1948	3 24 20.5	13.851	6	1 24 43.77	2.2230	13 33 0.9	11.083
7	23 41 20.13	2.1942	3 38 10.6	13.820	7	1 26 57.20	2.2246	13 44 3.4	11.000
8	23 43 31.77	2.1937	3 51 58.9	13.789	8	1 29 10.72	2.2261	13 55 0.9	10.915
9	23 45 43.37	2.1931	4 5 45.3	13.757	9	1 31 24.33	2.2277	14 5 53.2	10.830
10	23 47 54.94	2.1926	4 19 29.7	13.722	10	1 33 38.05	2.2294	14 16 40.5	10.744
11	23 50 6.48	2.1922	4 33 12.0	13.687	11	1 35 51.86	2.2311	14 27 22.5	10.656
12	23 52 18.00	2.1918	4 46 52.2	13.651	12	1 38 5.78	2.2328	14 37 59.2	10.567
13	23 54 29.50	2.1916	5 0 30.1	13.612	13	1 40 19.80	2.2346	14 48 30.6	10.479
14	23 56 40.99	2.1913	5 14 5.7	13.573	14	1 42 33.93	2.2363	14 58 56.7	10.389
15	23 58 52.46	2.1912	5 27 38.9	13.533	15	1 44 48.16	2.2380	15 9 17.3	10.298
16	0 1 3.93	2.1912	5 41 9.7	13.492	16	1 47 2.49	2.2397	15 19 32.5	10.207
17	0 3 15.39	2.1910	5 54 38.0	13.449	17	1 49 16.93	2.2416	15 29 42.2	10.115
18	0 5 26.85	2.1910	6 8 3.6	13.405	18	1 51 31.48	2.2434	15 39 46.3	10.021
19	0 7 38.31	2.1911	6 21 26.6	13.360	19	1 53 46.14	2.2452	15 49 44.7	9.927
20	0 9 49.78	2.1912	6 34 46.8	13.313	20	1 56 0.91	2.2471	15 59 37.5	9.832
21	0 12 1.25	2.1912	6 48 4.2	13.267	21	1 58 15.79	2.2489	16 9 24.5	9.735
22	0 14 12.73	2.1915	7 1 18.8	13.218	22	2 0 30.78	2.2507	16 19 5.7	9.638
23	0 16 24.23	2.1918	7 14 30.4	13.167	23	2 2 45.88	2.2526	16 28 41.1	9.541
24	0 18 35.75	2.1922	N. 7 27 38.9	13.117	24	2 5 1.09	2.2544	N.16 38 10.6	9.442

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 9.					**THURSDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 5 1.09	2.2544	N.16 38 10.6	9.442	0	3 55 9.21	2.3237	N.22 4 39.6	3.944
1	2 7 16.41	2.2563	16 47 34.2	9.343	1	3 57 28.65	2.3242	22 8 32.5	3.818
2	2 9 31.85	2.2582	16 56 51.8	9.243	2	3 59 48.12	2.3247	22 12 17.8	3.692
3	2 11 47.39	2.2600	17 6 3.4	9.142	3	4 2 7.62	2.3252	22 15 55.5	3.566
4	2 14 3.05	2.2619	17 15 8.9	9.040	4	4 4 27.14	2.3254	22 19 25.8	3.440
5	2 16 18.82	2.2637	17 24 8.2	8.937	5	4 6 46.67	2.3257	22 22 48.4	3.313
6	2 18 34.70	2.2656	17 33 1.4	8.835	6	4 9 6.22	2.3260	22 26 3.3	3.186
7	2 20 50.69	2.2675	17 41 48.4	8.731	7	4 11 25.79	2.3262	22 29 10.7	3.059
8	2 23 6.80	2.2693	17 50 29.1	8.627	8	4 13 45.36	2.3262	22 32 10.4	2.932
9	2 25 23.01	2.2712	17 59 3.6	8.521	9	4 16 4.93	2.3262	22 35 2.5	2.805
10	2 27 39.34	2.2730	18 7 31.6	8.414	10	4 18 24.50	2.3262	22 37 47.0	2.677
11	2 29 55.77	2.2748	18 15 53.3	8.307	11	4 20 44.07	2.3261	22 40 23.8	2.549
12	2 32 12.32	2.2767	18 24 8.5	8.199	12	4 23 3.63	2.3259	22 42 52.9	2.422
13	2 34 28.98	2.2785	18 32 17.2	8.091	13	4 25 23.18	2.3257	22 45 14.4	2.295
14	2 36 45.74	2.2802	18 40 19.4	7.982	14	4 27 42.71	2.3254	22 47 28.3	2.167
15	2 39 2.61	2.2820	18 48 15.1	7.873	15	4 30 2.23	2.3251	22 49 34.5	2.039
16	2 41 19.58	2.2837	18 56 4.2	7.762	16	4 32 21.72	2.3246	22 51 33.0	1.912
17	2 43 36.66	2.2856	19 3 46.6	7.651	17	4 34 41.18	2.3241	22 53 23.9	1.784
18	2 45 53.85	2.2873	19 11 22.4	7.539	18	4 37 0.61	2.3235	22 55 7.1	1.657
19	2 48 11.14	2.2890	19 18 51.4	7.427	19	4 39 20.00	2.3229	22 56 42.7	1.529
20	2 50 28.53	2.2907	19 26 13.7	7.315	20	4 41 39.36	2.3222	22 58 10.6	1.401
21	2 52 46.02	2.2923	19 33 29.2	7.201	21	4 43 58.67	2.3214	22 59 30.8	1.273
22	2 55 3.61	2.2940	19 40 37.8	7.086	22	4 46 17.93	2.3207	23 0 43.4	1.147
23	2 57 21.30	2.2956	N.19 47 39.5	6.971	23	4 48 37.15	2.3197	N.23 1 48.4	1.019
	WEDNESDAY 10.					**FRIDAY 12.**			
0	2 59 39.08	2.2972	N.19 54 34.3	6.856	0	4 50 56.30	2.3187	N.23 2 45.7	0.892
1	3 1 56.96	2.2987	20 1 22.2	6.741	1	4 53 15.40	2.3177	23 3 35.4	0.764
2	3 4 14.93	2.3003	20 8 3.2	6.624	2	4 55 34.43	2.3166	23 4 17.4	0.637
3	3 6 33.00	2.3018	20 14 37.1	6.507	3	4 57 53.39	2.3154	23 4 51.9	0.511
4	3 8 51.15	2.9032	20 21 4.0	6.389	4	5 0 12.28	2.3142	23 5 18.7	0.384
5	3 11 9.39	2.3047	20 27 23.8	6.271	5	5 2 31.09	2.3128	23 5 38.0	0.258
6	3 13 27.72	2.3061	20 33 36.5	6.152	6	5 4 49.82	2.3115	23 5 49.7	0.132
7	3 15 46.12	2.3074	20 39 42.1	6.033	7	5 7 8.47	2.3102	23 5 53.8	+ 0.006
8	3 18 4.61	2.3087	20 45 40.5	5.913	8	5 9 27.04	2.3087	23 5 50.4	− 0.120
9	3 20 23.17	2.3100	20 51 31.7	5.793	9	5 11 45.51	2.3070	23 5 39.4	0.246
10	3 22 41.81	2.3113	20 57 15.7	5.672	10	5 14 3.88	2.3053	23 5 20.9	0.371
11	3 25 0.53	2.3125	21 2 52.4	5.552	11	5 16 22.15	2.3037	23 4 54.9	0.495
12	3 27 19.31	2.3136	21 8 21.9	5.431	12	5 18 40.32	2.3019	23 4 21.5	0.619
13	3 29 38.16	2.3147	21 13 44.1	5.308	13	5 20 58.38	2.3001	23 3 40.6	0.744
14	3 31 57.08	2.3158	21 18 58.9	5.186	14	5 23 16.33	2.2982	23 2 52.2	0.868
15	3 34 16.06	2.3168	21 24 6.4	5.064	15	5 25 34.16	2.2962	23 1 56.4	0.992
16	3 36 35.10	2.3178	21 29 6.6	4.941	16	5 27 51.87	2.2942	23 0 53.2	1.115
17	3 38 54.20	2.3187	21 33 59.3	4.817	17	5 30 9.46	2.2921	22 59 42.6	1.237
18	3 41 13.35	2.3196	21 38 44.6	4.693	18	5 32 26.92	2.2899	22 58 24.7	1.360
19	3 43 32.55	2.3204	21 43 22.5	4.569	19	5 34 44.25	2.2877	22 56 59.4	1.482
20	3 45 51.80	2.3212	21 47 52.9	4.445	20	5 37 1.44	2.2853	22 55 26.8	1.604
21	3 48 11.10	2.3220	21 52 15.9	4.320	21	5 39 18.49	2.2830	22 53 46.9	1.725
22	3 50 30.44	2.3226	21 56 31.3	4.194	22	5 41 35.40	2.2807	22 51 59.8	1.845
23	3 52 49.81	2.3231	22 0 39.2	4.069	23	5 43 52.17	2.2782	22 50 5.5	1.965
24	3 55 9.21	2.3237	N.22 4 39.6	3.944	24	5 46 8.79	2.2757	N.22 48 4.0	2.085

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 13.					**MONDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 46 8.79	2.2757	N.22 48 4.0	2.085	0	7 31 34.48	2.1044	N.19 1 37.8	7.070
1	5 48 25.25	2.2731	22 45 55.3	2.205	1	7 33 40.62	2.1003	18 54 31.0	7.155
2	5 50 41.56	2.2704	22 43 39.4	2.324	2	7 35 46.52	2.0962	18 47 19.2	7.238
3	5 52 57.70	2.2677	22 41 16.4	2.442	3	7 37 52.16	2.0920	18 40 2.4	7.322
4	5 55 13.68	2.2650	22 38 46.3	2.560	4	7 39 57.56	2.0879	18 32 40.6	7.404
5	5 57 29.50	2.2622	22 36 9.2	2.677	5	7 42 2.71	2.0838	18 25 13.9	7.486
6	5 59 45.15	2.2593	22 33 25.0	2.794	6	7 44 7.61	2.0797	18 17 42.3	7.566
7	6 2 0.62	2.2563	22 30 33.9	2.910	7	7 46 12.27	2.0755	18 10 6.0	7.645
8	6 4 15.91	2.2534	22 27 35.8	3.026	8	7 48 16.67	2.0713	18 2 24.9	7.724
9	6 6 31.03	2.2504	22 24 30.8	3.141	9	7 50 20.83	2.0672	17 54 39.1	7.802
10	6 8 45.96	2.2473	22 21 18.9	3.255	10	7 52 24.74	2.0631	17 46 48.6	7.880
11	6 11 0.71	2.2442	22 18 0.2	3.368	11	7 54 28.40	2.0590	17 38 53.5	7.956
12	6 13 15.26	2.2410	22 14 34.7	3.482	12	7 56 31.82	2.0549	17 30 53.8	8.031
13	6 15 29.63	2.2378	22 11 2.4	3.594	13	7 58 34.99	2.0508	17 22 49.7	8.105
14	6 17 43.80	2.2345	22 7 23.4	3.706	14	8 0 37.92	2.0467	17 14 41.2	8.178
15	6 19 57.77	2.2312	22 3 37.7	3.817	15	8 2 40.60	2.0426	17 6 28.3	8.251
16	6 22 11.55	2.2279	21 59 45.3	3.928	16	8 4 43.03	2.0386	16 58 11.1	8.322
17	6 24 25.12	2.2244	21 55 46.3	4.038	17	8 6 45.23	2.0346	16 49 49.6	8.394
18	6 26 38.48	2.2210	21 51 40.7	4.147	18	8 8 47.18	2.0304	16 41 23.8	8.464
19	6 28 51.64	2.2176	21 47 28.6	4.255	19	8 10 48.88	2.0264	16 32 53.9	8.533
20	6 31 4.59	2.2141	21 43 10.1	4.363	20	8 12 50.35	2.0225	16 24 19.8	8.602
21	6 33 17.33	2.2106	21 38 45.0	4.471	21	8 14 51.58	2.0184	16 15 41.7	8.669
22	6 35 29.86	2.2069	21 34 13 6	4.577	22	8 16 52.56	2.0144	16 6 59.5	8.736
23	6 37 42.16	2.2033	N.21 29 35.8	4.682	23	8 18 53.31	2.0106	N.15 58 13.4	8.801
	SUNDAY 14.					**TUESDAY 16.**			
0	6 39 54.25	2.1997	N.21 24 51.7	4.787	0	8 20 53.83	2.0067	N.15 49 23.4	8.866
1	6 42 6.12	2.1959	21 20 1.3	4.892	1	8 22 54.11	2.0027	15 40 29.5	8.930
2	6 44 17.76	2.1922	21 15 4.7	4.995	2	8 24 54.16	1.9988	15 31 31.8	8.993
3	6 46 29.18	2.1884	21 10 1.9	5.097	3	8 26 53.97	1.9949	15 22 30.3	9.056
4	6 48 40.37	2.1847	21 4 53.0	5.200	4	8 28 53.55	1.9911	15 13 25.1	9.117
5	6 50 51.34	2.1808	20 59 37.9	5.302	5	8 30 52.90	1.9872	15 4 16.2	9.178
6	6 53 2.07	2.1769	20 54 16.8	5.402	6	8 32 52.02	1.9835	14 55 3.7	9.238
7	6 55 12.57	2.1731	20 48 49.7	5.501	7	8 34 50.92	1.9797	14 45 47.6	9.297
8	6 57 22.84	2.1692	20 43 16.7	5.600	8	8 36 49.59	1.9759	14 36 28.1	9.354
9	6 59 32.88	2.1653	20 37 37.7	5.698	9	8 38 48.03	1.9722	14 27 5.1	9.412
10	7 1 42.68	2.1613	20 31 52.9	5.796	10	8 40 46.25	1.9686	14 17 38.6	9.469
11	7 3 52.24	2.1573	20 26 2.2	5.892	11	8 42 44.26	1.9649	14 8 8.8	9.524
12	7 6 1.56	2.1533	20 20 5.8	5.987	12	8 44 42.04	1.9612	13 58 35.7	9.579
13	7 8 10.64	2.1494	20 14 3.7	6.082	13	8 46 39.61	1.9577	13 48 59.3	9.633
14	7 10 19.49	2.1454	20 7 56.0	6.176	14	8 48 36.96	1.9541	13 39 19.7	9.686
15	7 12 28.09	2.1413	20 1 42.6	6.270	15	8 50 34.10	1.9506	13 29 37.0	9.737
16	7 14 36.45	2.1372	19 55 23.6	6.362	16	8 52 31.03	1.9471	13 19 51.2	9.789
17	7 16 44.56	2.1332	19 48 59.2	6.452	17	8 54 27.75	1.9436	13 10 2.3	9.840
18	7 18 52.43	2.1292	19 42 29.3	6.544	18	8 56 24.26	1.9402	13 0 10.4	9.890
19	7 21 0.06	2.1251	19 35 53.9	6.634	19	8 58 20.57	1.9367	12 50 15 5	9.939
20	7 23 7.44	2.1209	19 29 13.2	6.722	20	9 0 16.67	1.9334	12 40 17.7	9.987
21	7 25 14.57	2.1168	19 22 27.2	6.811	21	9 2 12.58	1.9301	12 30 17.1	10.034
22	7 27 21.45	2.1127	19 15 35.9	6.898	22	9 4 8.28	1.9267	12 20 13.6	10.082
23	7 29 28.09	2.1086	19 8 39.4	6.984	23	9 6 3.78	1.9234	12 10 7.3	10.127
24	7 31 34.48	2.1044	N.19 1 37.8	7.070	24	9 7 59.09	1.9202	N.11 59 58.4	10.171

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 17.					FRIDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 7 59.09	1.9202	N. 11 59 58.4	10.171	0	10 37 16.02	1.8182	N. 3 14 9.9	11.463
1	9 9 54.21	1.9171	11 49 46.8	10.216	1	10 39 5.09	1.8174	3 2 41.8	11.474
2	9 11 49.14	1.9139	11 39 32.5	10.260	2	10 40 54.11	1.8166	2 51 13.0	11.484
3	9 13 43.88	1.9108	11 29 15.6	10.302	3	10 42 43.08	1.8158	2 39 43.7	11.492
4	9 15 38.44	1.9078	11 18 56.2	10.344	4	10 44 32.00	1.8150	2 28 13.9	11.501
5	9 17 32.82	1.9047	11 8 34.2	10.385	5	10 46 20.88	1.8144	2 16 43.6	11.508
6	9 19 27.01	1.9017	10 58 9.9	10.425	6	10 48 9.73	1.8138	2 5 12.9	11.515
7	9 21 21.03	1.8988	10 47 43.2	10.465	7	10 49 58.54	1.8132	1 53 41.8	11.522
8	9 23 14.87	1.8958	10 37 14.1	10.504	8	10 51 47.32	1.8127	1 42 10.2	11.528
9	9 25 8.53	1.8930	10 26 42.7	10.542	9	10 53 36.07	1.8122	1 30 38.3	11.533
10	9 27 2.03	1.8902	10 16 9.1	10.578	10	10 55 24.79	1.8118	1 19 6.2	11.537
11	9 28 55.36	1.8874	10 5 33.3	10.615	11	10 57 13.49	1.8115	1 7 33.9	11.541
12	9 30 48.52	1.8847	9 54 55.3	10.651	12	10 59 2.17	1.8112	0 56 1.3	11.544
13	9 32 41.52	1.8820	9 44 15.2	10.686	13	11 0 50.84	1.8111	0 44 28.6	11.547
14	9 34 34.36	1.8793	9 33 33.0	10.721	14	11 2 39.50	1.8109	0 32 55.7	11.549
15	9 36 27.04	1.8767	9 22 48.7	10.754	15	11 4 28.15	1.8107	0 21 22.7	11.551
16	9 38 19.57	1.8742	9 12 2.5	10.787	16	11 6 16.79	1.8107	N. 0 9 49.6	11.552
17	9 40 11.95	1.8717	9 1 14.3	10.818	17	11 8 5.43	1.8107	S. 0 1 43.5	11.552
18	9 42 4.17	1.8692	8 50 24.3	10.849	18	11 9 54.07	1.8107	0 13 16.6	11.551
19	9 43 56.25	1.8668	8 39 32.4	10.881	19	11 11 42.72	1.8109	0 24 49.6	11.550
20	9 45 48.19	1.8645	8 28 38.6	10.911	20	11 13 31.38	1.8111	0 36 22.6	11.548
21	9 47 39.99	1.8621	8 17 43.1	10.939	21	11 15 20.05	1.8113	0 47 55.4	11.546
22	9 49 31.64	1.8598	8 6 45.9	10.967	22	11 17 8.74	1.8117	0 59 28.1	11.543
23	9 51 23.17	1.8577	N. 7 55 47.0	10.995	23	11 18 57.45	1.8120	S. 1 11 0.6	11.539
	THURSDAY 18.					SATURDAY 20.			
0	9 53 14.56	1.8554	N. 7 44 46.5	11.022	0	11 20 46.18	1.8124	S. 1 22 32.8	11.535
1	9 55 5.82	1.8533	7 33 44.4	11.048	1	11 22 34.94	1.8129	1 34 4.8	11.531
2	9 56 56.96	1.8512	7 22 40.7	11.074	2	11 24 23.73	1.8134	1 45 36.5	11.525
3	9 58 47.97	1.8491	7 11 35.5	11.098	3	11 26 12.55	1.8140	1 57 7.8	11.519
4	10 0 38.85	1.8471	7 0 28.9	11.123	4	11 28 1.41	1.8147	2 8 38.8	11.513
5	10 2 29.62	1.8452	6 49 20.8	11.147	5	11 29 50.31	1.8154	2 20 9.4	11.506
6	10 4 20.28	1.8434	6 38 11.3	11.169	6	11 31 39.26	1.8162	2 31 39.5	11.497
7	10 6 10.83	1.8416	6 27 0.5	11.191	7	11 33 28.25	1.8169	2 43 9.1	11.489
8	10 8 1.27	1.8397	6 15 48.4	11.212	8	11 35 17.29	1.8178	2 54 38.2	11.481
9	10 9 51.60	1.8380	6 4 35.0	11.233	9	11 37 6.39	1.8187	3 6 6.8	11.471
10	10 11 41.83	1.8363	5 53 20.4	11.253	10	11 38 55.54	1.8197	3 17 34.7	11.460
11	10 13 31.96	1.8347	5 42 4.6	11.272	11	11 40 44.76	1.8207	3 29 2.0	11.450
12	10 15 21.99	1.8331	5 30 47.7	11.291	12	11 42 34.03	1.8218	3 40 28.7	11.438
13	10 17 11.93	1.8316	5 19 29.7	11.309	13	11 44 23.38	1.8231	3 51 54.6	11.426
14	10 19 1.78	1.8301	5 8 10.6	11.327	14	11 46 12.80	1.8243	4 3 19.8	11.414
15	10 20 51.54	1.8287	4 56 50.5	11.343	15	11 48 2.30	1.8256	4 14 44.3	11.401
16	10 22 41.22	1.8273	4 45 29.4	11.360	16	11 49 51.87	1.8269	4 26 7.9	11.386
17	10 24 30.82	1.8260	4 34 7.3	11.375	17	11 51 41.53	1.8284	4 37 30.6	11.372
18	10 26 20.34	1.8247	4 22 44.4	11.389	18	11 53 31.28	1.8298	4 48 52.5	11.357
19	10 28 9.79	1.8235	4 11 20.6	11.404	19	11 55 21.11	1.8313	5 0 13.4	11.341
20	10 29 59.16	1.8223	3 59 55.9	11.417	20	11 57 11.04	1.8330	5 11 33.4	11.324
21	10 31 48.47	1.8213	3 48 30.5	11.430	21	11 59 1.07	1.8347	5 22 52.3	11.307
22	10 33 37.72	1.8202	3 37 4.3	11.442	22	12 0 51.20	1.8363	5 34 10.2	11.289
23	10 35 26.90	1.8192	3 25 37.4	11.453	23	12 2 41.43	1.8380	5 45 27.0	11.271
24	10 37 16.02	1.8182	N. 3 14 9.9	11.463	24	12 4 31.76	1.8398	S. 5 56 42.7	11.252

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 21.					TUESDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 4 31.76	1.8398	S. 5 56 42.7	11.252	0	13 36 4.27	1.9962	S.14 22 6.1	9.525
1	12 6 22.21	1.8418	6 7 57.2	11.232	1	13 38 4.18	2.0008	14 31 36.0	9.471
2	12 8 12.78	1.8438	6 19 10.6	11.212	2	13 40 4.37	2.0055	14 41 2.6	9.416
3	12 10 3.47	1.8457	6 30 22.7	11.191	3	13 42 4.84	2.0102	14 50 25.9	9.359
4	12 11 54.27	1.8478	6 41 33.5	11.169	4	13 44 5.59	2.0149	14 59 45.7	9.301
5	12 13 45.21	1.8500	6 52 43.0	11.147	5	13 46 6.63	2.0197	15 9 2.0	9.242
6	12 15 36.27	1.8522	7 3 51.2	11.125	6	13 48 7.95	2.0245	15 18 14.8	9.183
7	12 17 27.47	1.8544	7 14 58.0	11.102	7	13 50 9.57	2.0295	15 27 24.0	9.123
8	12 19 18.80	1.8567	7 26 3.4	11.077	8	13 52 11.49	2.0344	15 36 29.6	9.062
9	12 21 10.27	1.8591	7 37 7.3	11.052	9	13 54 13.70	2.0393	15 45 31.5	9.001
10	12 23 1.89	1.8616	7 48 9.7	11.027	10	13 56 16.21	2.0443	15 54 29.7	8.937
11	12 24 53.66	1.8640	7 59 10.5	11.000	11	13 58 19.02	2.0494	16 3 24.0	8.873
12	12 26 45.57	1.8665	8 10 9.7	10.973	12	14 0 22.14	2.0546	16 12 14.5	8.809
13	12 28 37.64	1.8692	8 21 7.3	10.947	13	14 2 25.57	2.0597	16 21 1.1	8.743
14	12 30 29.87	1.8718	8 32 3.3	10.918	14	14 4 29.30	2.0648	16 29 43.7	8.677
15	12 32 22.25	1.8745	8 42 57.5	10.889	15	14 6 33.35	2.0701	16 38 22.3	8.610
16	12 34 14.81	1.8773	8 53 50.0	10.860	16	14 8 37.71	2.0753	16 46 56.9	8.542
17	12 36 7.53	1.8801	9 4 40.7	10.830	17	14 10 42.39	2.0807	16 55 27.3	8.472
18	12 38 0.42	1.8830	9 15 29.6	10.799	18	14 12 47.39	2.0860	17 3 53.5	8.401
19	12 39 53.49	1.8860	9 26 16.6	10.767	19	14 14 52.71	2.0914	17 12 15.4	8.329
20	12 41 46.74	1.8890	9 37 1.7	10.735	20	14 16 58.36	2.0968	17 20 33.0	8.257
21	12 43 40.17	1.8921	9 47 44.8	10.702	21	14 19 4.33	2.1022	17 28 46.3	8.184
22	12 45 33.79	1.8952	9 58 25.9	10.667	22	14 21 10.62	2.1077	17 36 55.1	8.109
23	12 47 27.59	1.8983	S.10 9 4.9	10.633	23	14 23 17.25	2.1132	S.17 44 59.4	8.034
	MONDAY 22.					WEDNESDAY 24.			
0	12 49 21.59	1.9017	S.10 19 41.9	10.598	0	14 25 24.21	2.1187	S.17 52 59.2	7.958
1	12 51 15.79	1.9049	10 30 16.7	10.562	1	14 27 31.50	2.1243	18 0 54.4	7.881
2	12 53 10.18	1.9082	10 40 49.4	10.526	2	14 29 39.13	2.1299	18 8 44.9	7.802
3	12 55 4.78	1.9117	10 51 19.8	10.488	3	14 31 47.09	2.1355	18 16 30.6	7.722
4	12 56 59.59	1.9152	11 1 48.0	10.451	4	14 33 55.39	2.1412	18 24 11.6	7.642
5	12 58 54.60	1.9187	11 12 13.9	10.412	5	14 36 4.03	2.1468	18 31 47.7	7.561
6	13 0 49.83	1.9223	11 22 37.5	10.372	6	14 38 13.01	2.1525	18 39 18.9	7.478
7	13 2 45.28	1.9260	11 32 58.6	10.332	7	14 40 22.33	2.1582	18 46 45.1	7.394
8	13 4 40.95	1.9297	11 43 17.3	10.291	8	14 42 32.00	2.1640	18 54 6.2	7.310
9	13 6 36.84	1.9333	11 53 33.5	10.248	9	14 44 42.01	2.1697	19 1 22.4	7.225
10	13 8 32.95	1.9372	12 3 47.2	10.206	10	14 46 52.37	2.1756	19 8 33.3	7.138
11	13 10 29.30	1.9411	12 13 58.3	10.163	11	14 49 3.08	2.1813	19 15 39.0	7.050
12	13 12 25.88	1.9450	12 24 6.8	10.119	12	14 51 14.13	2.1871	19 22 39.3	6.961
13	13 14 22.70	1.9490	12 34 12.6	10.074	13	14 53 25.53	2.1930	19 29 34.3	6.872
14	13 16 19.76	1.9530	12 44 15.7	10.028	14	14 55 37.29	2.1988	19 36 23.9	6.781
15	13 18 17.06	1.9571	12 54 16.0	9.982	15	14 57 49.39	2.2047	19 43 8.0	6.689
16	13 20 14.61	1.9612	13 4 13.5	9.934	16	15 0 1.85	2.2106	19 49 46.6	6.596
17	13 22 12.41	1.9654	13 14 8.1	9.886	17	15 2 14.66	2.2164	19 56 19.5	6.502
18	13 24 10.46	1.9697	13 23 59.8	9.837	18	15 4 27.82	2.2222	20 2 46.8	6.407
19	13 26 8.77	1.9740	13 33 48.6	9.787	19	15 6 41.33	2.2281	20 9 8.3	6.310
20	13 28 7.34	1.9783	13 43 34.3	9.737	20	15 8 55.19	2.2340	20 15 24.0	6.212
21	13 30 6.17	1.9827	13 53 17.0	9.686	21	15 11 9.41	2.2399	20 21 33.8	6.114
22	13 32 5.27	1.9872	14 2 56.6	9.633	22	15 13 23.98	2.2457	20 27 37.7	6.015
23	13 34 4.64	1.9917	14 12 33.0	9.579	23	15 15 38.90	2.2517	20 33 35.6	5.914
24	13 36 4.27	1.9962	S.14 22 6.1	9.525	24	15 17 54.18	2.2576	S.20 39 27.4	5.831

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 25.					SATURDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 17 54.18	2.2576	S.20 39 27.4	5.813	0	17 12 31.93	2.4992	S.23 1 17.6	0.270
1	15 20 9.81	2.2635	20 45 13.1	5.710	1	17 15 1.99	2.5027	23 0 57.0	0.417
2	15 22 25.80	2.2693	20 50 52.6	5.606	2	17 17 32.25	2.5059	23 0 27.5	0.566
3	15 24 42.13	2.2752	20 56 25.8	5.500	3	17 20 2.70	2.5092	22 59 49.1	0.715
4	15 26 58.82	2.2811	21 1 52.6	5.394	4	17 22 33.35	2.5123	22 59 1.7	0.864
5	15 29 15.86	2.2869	21 7 13.1.	5.287	5	17 25 4.18	2.5153	22 58 5.4	1.013
6	15 31 33.25	2.2927	21 12 27.1	5.179	6	17 27 35.19	2.5182	22 57 0.1	1.164
7	15 33 50.98	2.2985	21 17 34.6	5.070	7	17 30 6.37	2.5211	22 55 45.7	1.315
8	15 36 9.07	2.3043	21 22 35.5	4.959	8	17 32 37.72	2.5239	22 54 22.3	1.466
9	15 38 27.50	2.3101	21 27 29.7	4.847	9	17 35 9.24	2.5266	22 52 49.8	1.617
10	15 40 46.28	2.3157	21 32 17.2	4.735	10	17 37 40.91	2.5291	22 51 8.3	1.768
11	15 43 5.39	2.3214	21 36 57.9	4.622	11	17 40 12.73	2.5315	22 49 17.6	1.922
12	15 45 24.85	2.3272	21 41 31.8	4.507	12	17 42 44.69	2.5338	22 47 17.7	2.074
13	15 47 44.66	2.3329	21 45 58.8	4.392	13	17 45 16.79	2.5361	22 45 8.7	2.227
14	15 50 4.80	2.3386	21 50 18.8	4.274	14	17 47 49.02	2.5382	22 42 50.5	2.379
15	15 52 25.29	2.3442	21 54 31.7	4.156	15	17 50 21.37	2.5401	22 40 23.2	2.532
16	15 54 46.11	2.3497	21 58 37.5	4.037	16	17 52 53.83	2.5420	22 37 46.6	2.687
17	15 57 7.26	2.3552	22 2 36.1	3.917	17	17 55 26.41	2.5439	22 35 0.8	2.840
18	15 59 28.74	2.3608	22 6 27.5	3.796	18	17 57 59.10	2.5456	22 32 5.8	2.994
19	16 1 50.56	2.3663	22 10 11.6	3.674	19	18 0 31.88	2.5472	22 29 1.5	3.148
20	16 4 12.70	2.3717	22 13 48.5	3.551	20	18 3 4.76	2.5487	22 25 48.0	3.302
21	16 6 35.16	2.3771	22 17 17.8	3.427	21	18 5 37.72	2.5500	22 22 25.3	3.456
22	16 8 57.95	2.3824	22 20 39.7	3.302	22	18 8 10.76	2.5513	22 18 53.3	3.611
23	16 11 21.05	2.3877	S.22 23 54.0	3.175	23	18 10 43.88	2.5526	S.22 15 12.0	3.765
	FRIDAY 26.					SUNDAY 28.			
0	16 13 44.47	2.3930	S.22 27 0.7	3.048	0	18 13 17.07	2.5536	S.22 11 21.5	3.918
1	16 16 8.21	2.3982	22 29 59.8	2.920	1	18 15 50.31	2.5545	22 7 21.8	4.072
2	16 18 32.25	2.4032	22 32 51.1	2.790	2	18 18 23.61	2.5553	22 3 12.8	4.227
3	16 20 56.60	2.4084	22 35 34.6	2.661	3	18 20 56.95	2.5560	21 58 54.6	4.381
4	16 23 21.26	2.4135	22 38 10.4	2.530	4	18 23 30.33	2.5567	21 54 27.1	4.534
5	16 25 46.22	2.4184	22 40 38.2	2.397	5	18 26 3.75	2.5572	21 49 50.5	4.687
6	16 28 11.47	2.4233	22 42 58.0	2.264	6	18 28 37.19	2.5576	21 45 4.6	4.841
7	16 30 37.02	2.4282	22 45 9.9	2.131	7	18 31 10.66	2.5580	21 40 9.6	4.994.
8	16 33 2.85	2.4329	22 47 13.7	1.996	8	18 33 44.15	2.5582	21 35 5.3	5.147
9	16 35 28.97	2.4377	22 49 9.4	1.860	9	18 36 17.64	2.5582	21 29 51.9	5.299
10	16 37 55.37	2.4423	22 50 56.9	1.723	10	18 38 51.14	2.5583	21 24 29.4	5.451
11	16 40 22.04	2.4468	22 52 36.2	1.587	11	18 41 24.64	2.5582	21 18 57.8	5.603
12	16 42 48.99	2.4514	22 54 7.3	1.448	12	18 43 58.13	2.5580	21 13 17.0	5.755
13	16 45 16.21	2.4558	22 55 30.0	1.309	13	18 46 31.60	2.5577	21 7 27.2	5.905
14	16 47 43.69	2.4602	22 56 44.4	1.169	14	18 49 5.06	2.5573	21 1 28.4	6.056
15	16 50 11.43	2.4644	22 57 50.3	1.028	15	18 51 38.48	2.5568	20 55 20.5	6.206
16	16 52 39.42	2.4686	22 58 47.8	0.887	16	18 54 11.87	2.5563	20 49 3.7	6.355
17	16 55 7.66	2.4727	22 59 36.7	0.744	17	18 56 45.23	2.5557	20 42 37.9	6.504
18	16 57 36.15	2.4768	23 0 17.1	0.602	18	18 59 18.55	2.5548	20 36 3.2	6.652
19	17 0 4.88	2.4807	23 0 48.9	0.458	19	19 1 51.81	2.5539	20 29 19.6	6.800
20	17 2 33.84	2.4846	23 1 12.1	0.314	20	19 4 25.02	2.5530	20 22 27.2	6.947
21	17 5 3.03	2.4884	23 1 26.6	0.169	21	19 6 58.17	2.5519	20 15 26.0	7.093.
22	17 7 32.45	2.4922	23 1 32.4	− 0.023	22	19 9 31.25	2.5507	20 8 16.0	7.238
23	17 10 2.09	2.4957	23 1 29.4	+ 0.123	23	19 12 4.26	2.5496	20 0 57.4	7.382
24	17 12 31.93	2.4992	S.23 1 17.6	0.270	24	19 14 37.20	2.5483	S.19 53 30.1	7.527

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 14 37.20	2.5483	S. 19 53 30.1	7.527
1	19 17 10.06	2.5469	19 45 54.2	7.670
2	19 19 42.83	2.5453	19 38 9.7	7.812
3	19 22 15.50	2.5437	19 30 16.7	7.953
4	19 24 48.08	2.5422	19 22 15.3	8.094
5	19 27 20.56	2.5405	19 14 5.4	8.234
6	19 29 52.94	2.5387	19 5 47.2	8.372
7	19 32 25.21	2.5368	18 57 20.7	8.510
8	19 34 57.36	2.5348	18 48 46.0	8.647
9	19 37 29.39	2.5328	18 40 3.1	8.782
10	19 40 1.30	2.5308	18 31 12.1	8.917
11	19 42 33.09	2.5287	18 22 13.1	9.050
12	19 45 4.74	2.5264	18 13 6.1	9.182
13	19 47 36.26	2.5242	18 3 51.2	9.313
14	19 50 7.64	2.5218	17 54 28.5	9.443
15	19 52 38.88	2.5195	17 44 58.0	9.572
16	19 55 9.98	2.5170	17 35 19.9	9.699
17	19 57 40.92	2.5145	17 25 34.0	9.826
18	20 0 11.72	2.5120	17 15 40.7	9.951
19	20 2 42.36	2.5093	17 5 39.9	10.074
20	20 5 12.84	2.5067	16 55 31.8	10.197
21	20 7 43.17	2.5041	16 45 16.3	10.317
22	20 10 13.33	2.5013	16 34 53.7	10.437
23	20 12 43.32	2.4985	S. 16 24 23.9	10.556

TUESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	20 15 13.15	2.4957	S. 16 13 47.0	10.672
1	20 17 42.81	2.4928	16 3 3.2	10.787
2	20 20 12.29	2.4899	15 52 12.5	10.902
3	20 22 41.60	2.4870	15 41 15.0	11.015
4	20 25 10.73	2.4840	15 30 10.7	11.126
5	20 27 39.68	2.4810	15 18 59.9	11.234
6	20 30 8.45	2.4780	15 7 42.6	11.342
7	20 32 37.04	2.4750	14 56 18.8	11.449
8	20 35 5.45	2.4719	14 44 48.7	11.554
9	20 37 33.67	2.4687	14 33 12.3	11.657
10	20 40 1.70	2.4657	14 21 29.8	11.758
11	20 42 29.55	2.4625	14 9 41.3	11.859
12	20 44 57.20	2.4593	13 57 46.7	11.958
13	20 47 24.67	2.4562	13 45 46.3	12.054
14	20 49 51.94	2.4529	13 33 40.2	12.149
15	20 52 19.02	2.4497	13 21 28.4	12.242
16	20 54 45.91	2.4466	13 9 11.1	12.334
17	20 57 12.61	2.4434	12 56 48.3	12.424
18	20 59 39.12	2.4402	12 44 20.2	12.512
19	21 2 5.43	2.4369	12 31 46.8	12.599
20	21 4 31.55	2.4337	12 19 8.3	12.684
21	21 6 57.48	2.4305	12 6 24.7	12.768
22	21 9 23.21	2.4272	11 53 36.1	12.849
23	21 11 48.75	2.4241	11 40 42.8	12.928
24	21 14 14.10	2.4208	S. 11 27 44.7	13.007

WEDNESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	h m s	s	° ′ ″	″
0	21 14 14.10	2.4208	S. 11 27 44.7	13.007
1	21 16 39.25	2.4177	11 14 41.9	13.082
2	21 19 4.22	2.4145	11 1 34.7	13.157
3	21 21 28.99	2.4112	10 48 23.1	13.229
4	21 23 53.57	2.4080	10 35 7.2	13.300
5	21 26 17.95	2.4048	10 21 47.1	13.369
6	21 28 42.15	2.4018	10 8 22.9	13.437
7	21 31 6.17	2.3987	9 54 54.7	13.502
8	21 33 29.99	2.3955	9 41 22.7	13.565
9	21 35 53.63	2.3924	9 27 46.9	13.627
10	21 38 17.08	2.3893	9 14 7.5	13.687
11	21 40 40.35	2.3863	9 0 24.5	13.744
12	21 43 3.44	2.3833	8 46 38.2	13.800
13	21 45 26.35	2.3803	8 32 48.5	13.855
14	21 47 49.08	2.3773	8 18 55.6	13.907
15	21 50 11.63	2.3743	8 4 59.6	13.958
16	21 52 34.00	2.3714	7 51 0.6	14.007
17	21 54 56.20	2.3685	7 36 58.7	14.054
18	21 57 18.22	2.3657	7 22 54.1	14.099
19	21 59 40.08	2.3628	7 8 46.8	14.142
20	22 2 1.76	2.3600	6 54 37.0	14.184
21	22 4 23.28	2.3572	6 40 24.7	14.224
22	22 6 44.63	2.3545	6 26 10.1	14.262
23	22 9 5.82	2.3518	S. 6 11 53.3	14.298

THURSDAY, FEBRUARY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
0	22 11 26.84	2.3491	S. 5 57 34.3	14.332

PHASES OF THE MOON.

			d	h	m
●	New Moon	Jan.	1	1	51.9
☽	First Quarter		7	17	39.9
○	Full Moon		15	7	7.6
☾	Last Quarter		23	11	52.9
●	New Moon		30	13	22.6

			d	h
☾	Perigee	Jan.	3	4.9
☾	Apogee		19	4.9
☾	Perigee		31	12.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
3	SUN	W.	26 32 23	2421	28 15 28	2422	29 58 31	2424	31 41 32	2424
	a Arietis	E.	86 39 59	2129	84 49 45	2130	82 59 31	2132	81 9 20	2134
	Aldebaran	E.	119 38 26	2139	117 48 27	2139	115 58 27	2139	114 8 27	2139
4	SUN	W.	40 16 2	2439	41 58 41	2443	43 41 15	2448	45 23 41	2454
	a Arietis	E.	71 59 25	2152	70 9 45	2157	68 20 13	2163	66 30 50	2169
	Aldebaran	E.	104 59 1	2152	103 9 21	2157	101 19 48	2161	99 30 22	2167
5	SUN	W.	53 53 32	2491	55 34 58	2499	57 16 13	2508	58 57 15	2517
	VENUS	W.	27 20 20	2658	28 57 56	2658	30 35 32	2659	32 13 7	2662
	a Arietis	E.	57 26 36	2210	55 38 23	2220	53 50 26	2230	52 2 43	2241
	Aldebaran	E.	90 25 25	2200	88 36 58	2208	86 48 43	2216	85 0 40	2225
6	SUN	W.	67 19 5	2568	68 58 44	2578	70 38 9	2589	72 17 19	2601
	VENUS	W.	40 19 39	2690	41 56 32	2698	43 33 14	2707	45 9 45	2716
	a Arietis	E.	43 8 24	2304	41 22 30	2318	39 36 57	2333	37 51 46	2349
	Aldebaran	E.	76 3 52	2274	74 17 14	2284	72 30 51	2296	70 44 45	2307
	Pollux	E.	117 50 3	2318	116 4 30	2326	114 19 9	2335	112 34 0	2343
7	SUN	W.	80 29 13	2659	82 6 48	2671	83 44 7	2683	85 21 10	2694
	VENUS	W.	53 9 9	2766	54 44 21	2777	56 19 19	2788	57 54 2	2799
	Fomalhaut	W.	42 57 32	3463	44 18 38	3404	45 40 50	3352	47 4 1	3308
	Aldebaran	E.	61 58 24	2366	60 14 0	2378	58 29 53	2389	56 46 3	2403
	Pollux	E.	103 51 31	2391	102 7 43	2401	100 24 10	2411	98 40 51	2422
8	SUN	W.	93 22 27	2755	94 57 54	2767	96 33 5	2779	98 8 1	2791
	VENUS	W.	65 43 57	2857	67 17 11	2869	68 50 10	2880	70 22 54	2892
	Fomalhaut	W.	54 10 52	3158	55 37 51	3140	57 5 12	3124	58 32 53	3110
	a Pegasi	W.	32 2 42	2913	33 34 44	2882	35 7 26	2856	36 40 41	2835
	Aldebaran	E.	48 11 36	2469	46 29 39	2484	44 48 3	2498	43 6 47	2513
	Pollux	E.	90 8 5	2477	88 26 19	2487	86 44 48	2499	85 3 33	2510
9	SUN	W.	105 58 46	2850	107 32 9	2861	109 5 18	2873	110 38 12	2883
	VENUS	W.	78 2 52	2950	79 34 8	2962	81 5 9	2973	82 35 56	2985
	Fomalhaut	W.	65 54 36	3071	67 23 21	3068	68 52 10	3065	70 21 2	3065
	a Pegasi	W.	44 32 14	2779	46 7 10	2774	47 42 12	2771	49 17 18	2769
	Aldebaran	E.	34 45 50	2596	33 6 49	2615	31 28 14	2635	29 50 7	2656
	Pollux	E.	76 41 13	2566	75 1 32	2579	73 22 8	2590	71 42 59	2601
	Regulus	E.	113 31 44	2527	111 51 8	2536	110 10 45	2546	108 30 36	2556
10	SUN	W.	118 19 5	2940	119 50 33	2951	121 21 47	2962	122 52 48	2972
	VENUS	W.	90 6 18	3040	91 35 41	3051	93 4 51	3062	94 33 47	3073
	Fomalhaut	W.	77 45 11	3075	79 13 51	3079	80 42 26	3084	82 10 55	3091
	a Pegasi	W.	57 12 53	2775	58 47 53	2779	60 22 48	2783	61 57 39	2787
	Pollux	E.	63 31 15	2661	61 53 43	2673	60 16 27	2685	58 39 27	2698
	Regulus	E.	100 13 17	2606	98 34 30	2615	96 55 55	2624	95 17 33	2634
11	VENUS	W.	101 55 11	3126	103 22 49	3136	104 50 15	3146	106 17 29	3157
	Fomalhaut	W.	89 31 16	3129	90 58 51	3138	92 26 14	3148	93 53 25	3158
	a Pegasi	W.	69 50 20	2814	71 24 30	2820	72 58 32	2826	74 32 26	2833
	Pollux	E.	50 38 43	2763	49 3 27	2778	47 28 30	2792	45 53 52	2807
	Regulus	E.	87 8 57	2681	85 31 51	2690	83 54 58	2698	82 18 16	2707

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
3	SUN	W.	33 24 32	2425	35 7 31	2428	36 50 26	2431	38 33 17	2435
	α Arietis	E.	79 19 12	2136	77 29 7	2139	75 39 7	2143	73 49 13	2147
	Aldebaran	E.	112 18 28	2141	110 28 31	2143	108 38 37	2145	106 48 47	2148
4	SUN	W.	47 5 59	2460	48 48 8	2468	50 30 6	2475	52 11 54	2482
	α Arietis	E.	64 41 36	2176	62 52 33	2184	61 3 42	2192	59 15 3	2200
	Aldebaran	E.	97 41 4	2172	95 51 54	2178	94 2 54	2185	92 14 4	2192
5	SUN	W.	60 38 5	2527	62 18 41	2537	63 59 3	2547	65 39 11	2557
	VENUS	W.	33 50 38	2666	35 28 4	2670	37 5 24	2676	38 42 36	2683
	α Arietis	E.	50 15 17	2252	48 28 7	2264	46 41 15	2277	44 54 38	2291
	Aldebaran	E.	83 12 50	2235	81 25 14	2244	79 37 52	2254	77 50 45	2264
6	SUN	W.	73 56 13	2612	75 34 51	2624	77 13 14	2635	78 51 21	2646
	VENUS	W.	46 46 4	2725	48 22 10	2735	49 58 3	2745	51 33 42	2755
	α Arietis	E.	36 6 57	2366	34 22 34	2384	32 38 37	2404	30 55 8	2425
	Aldebaran	E.	68 58 56	2318	67 13 23	2329	65 28 6	2341	63 43 6	2353
	Pollux	E.	110 49 3	2353	109 4 20	2362	107 19 50	2371	105 35 34	2380
7	SUN	W.	86 57 58	2707	88 34 29	2719	90 10 44	2731	91 46 43	2742
	VENUS	W.	59 28 31	2811	61 2 45	2822	62 36 44	2834	64 10 28	2845
	Fomalhaut	W.	48 28 3	3270	49 52 50	3235	51 18 18	3206	52 44 20	3181
	Aldebaran	E.	55 2 32	2417	53 19 21	2429	51 36 28	2442	49 53 53	2455
	Pollux	E.	96 57 47	2432	95 14 58	2443	93 32 25	2454	91 50 7	2465
8	SUN	W.	99 42 41	2803	101 17 5	2815	102 51 14	2826	104 25 8	2838
	VENUS	W.	71 55 23	2904	73 27 37	2915	74 59 37	2927	76 31 22	2939
	Fomalhaut	W.	60 0 50	3099	61 29 1	3089	62 57 24	3082	64 25 56	3075
	α Pegasi	W.	38 14 23	2818	39 48 27	2804	41 22 50	2793	42 57 27	2785
	Aldebaran	E.	41 25 52	2528	39 45 18	2544	38 5 6	2560	36 25 16	2577
	Pollux	E.	83 22 33	2522	81 41 50	2533	80 1 22	2544	78 21 10	2555
9	SUN	W.	112 10 52	2895	113 43 16	2907	115 15 26	2917	116 47 23	2928
	VENUS	W.	84 6 28	2996	85 36 46	3007	87 6 50	3018	88 36 41	3029
	Fomalhaut	W.	71 49 55	3065	73 18 47	3066	74 47 38	3069	76 16 26	3071
	α Pegasi	W.	50 52 26	2769	52 27 35	2769	54 2 43	2771	55 37 49	2773
	Aldebaran	E.	28 12 28	2681	26 35 22	2709	24 58 54	2740	23 23 7	2775
	Pollux	E.	70 4 6	2613	68 25 29	2625	66 47 8	2637	65 9 3	2649
	Regulus	E.	106 50 41	2566	105 11 0	2576	103 31 32	2586	101 52 18	2596
10	SUN	W.	124 23 36	2983	125 54 10	2993	127 24 31	3004	128 54 38	3014
	VENUS	W.	96 2 30	3083	97 31 0	3094	98 59 16	3105	100 27 20	3115
	Fomalhaut	W.	83 39 16	3097	85 7 30	3105	86 35 33	3112	88 3 30	3119
	α Pegasi	W.	63 32 24	2792	65 7 3	2796	66 41 36	2801	68 16 2	2808
	Pollux	E.	57 2 44	2710	55 26 18	2723	53 50 9	2736	52 14 17	2750
	Regulus	E.	93 39 24	2643	92 1 28	2653	90 23 45	2663	88 46 15	2672
11	VENUS	W.	107 44 30	3167	109 11 19	3178	110 37 55	3188	112 4 19	3198
	Fomalhaut	W.	95 20 24	3170	96 47 9	3182	98 13 40	3194	99 39 56	3208
	α Pegasi	W.	76 6 11	2839	77 39 48	2847	79 13 15	2854	80 46 33	2861
	Pollux	E.	44 19 33	2823	42 45 35	2840	41 11 59	2857	39 38 45	2876
	Regulus	E.	80 41 46	2716	79 5 28	2725	77 29 22	2735	75 53 28	2744

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^h.	P. L. of Diff.	VI^h.	P. L. of Diff.	IX^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
12	Venus	W.	115 30 32	3208	114 56 32	3219	116 22 19	3228	117 47 55	3238
	Fomalhaut	W.	101 5 56	3221	102 31 40	3236	103 57 7	3251	105 22 16	3267
	a Pegasi	W.	82 19 42	2869	83 52 41	2876	85 25 31	2883	86 58 11	2892
	a Arietis	W.	38 49 50	2798	40 24 21	2802	41 58 46	2807	43 33 5	2811
	Pollux	E.	38 5 55	2895	36 33 30	2917	35 1 33	2940	33 30 5	2964
	Regulus	E.	74 17 46	2752	72 42 15	2761	71 6 56	2769	69 31 48	2779
	Spica	E.	128 17 43	2738	126 41 53	2746	125 6 14	2754	123 30 46	2762
13	a Pegasi	W.	94 38 53	2933	96 10 29	2942	97 41 54	2951	99 13 8	2960
	a Arietis	W.	51 22 57	2840	52 56 33	2846	54 30 0	2852	56 3 20	2859
	Aldebaran	W.	19 0 26	3050	20 29 37	3030	21 59 13	3011	23 29 12	2996
	Regulus	E.	61 39 1	2821	60 5 1	2831	58 31 13	2839	56 57 36	2848
	Spica	E.	115 36 2	2801	114 1 36	2810	112 27 21	2818	110 53 16	2826
14	a Arietis	W.	63 47 50	2892	65 20 19	2898	66 52 40	2905	68 24 52	2912
	Aldebaran	W.	31 2 41	2962	32 33 41	2961	34 4 43	2962	35 35 43	2962
	Regulus	E.	49 12 22	2893	47 39 54	2902	46 7 38	2912	44 35 34	2920
	Spica	E.	103 5 20	2863	101 32 14	2871	99 59 18	2878	98 26 31	2886
15	a Arietis	W.	76 3 40	2947	77 35 0	2954	79 6 11	2960	80 37 14	2966
	Aldebaran	W.	43 10 13	2977	44 40 54	2980	46 11 32	2985	47 42 4	2989
	Regulus	E.	36 58 16	2971	35 27 27	2983	33 56 53	2995	32 26 34	3006
	Spica	E.	90 44 58	2922	89 13 7	2929	87 41 25	2936	86 9 52	2942
	Jupiter	E.	132 13 25	2987	130 42 56	2993	129 12 35	3001	127 42 23	3008
16	a Arietis	W.	88 10 25	2999	89 40 39	3006	91 10 44	3012	92 40 42	3018
	Aldebaran	W.	55 13 17	3013	56 43 14	3018	58 13 4	3023	59 42 48	3028
	Spica	E.	78 34 13	2977	77 3 31	2982	75 32 56	2989	74 2 29	2995
	Jupiter	E.	120 13 26	3040	118 44 3	3046	117 14 47	3052	115 45 39	3058
	Antares	E.	124 2 26	2984	122 31 53	2990	121 1 28	2996	119 31 10	3001
17	Aldebaran	W.	67 9 58	3052	68 39 6	3056	70 8 9	3060	71 37 7	3065
	Pollux	W.	26 20 14	3319	27 44 3	3296	29 8 19	3277	30 32 57	3262
	Spica	E.	66 32 7	3024	65 2 24	3029	63 32 47	3034	62 3 17	3039
	Jupiter	E.	108 21 45	3087	106 53 19	3091	105 24 59	3096	103 56 45	3101
	Antares	E.	112 1 26	3029	110 31 49	3034	109 2 19	3039	107 32 55	3043
	Saturn	E.	133 41 29	3059	132 12 29	3064	130 43 36	3069	129 14 49	3075
18	Aldebaran	W.	79 0 38	3085	80 29 6	3088	81 57 30	3091	83 25 51	3094
	Pollux	W.	37 39 55	3212	39 5 50	3206	40 31 52	3201	41 58 0	3196
	Spica	E.	54 37 14	3061	53 8 17	3065	51 39 25	3069	50 10 37	3073
	Jupiter	E.	96 36 58	3122	95 9 15	3126	93 41 37	3129	92 14 3	3133
	Antares	E.	100 7 15	3063	98 38 22	3068	97 9 34	3072	95 40 49	3074
	Saturn	E.	121 52 21	3096	120 24 6	3100	118 55 56	3103	117 27 50	3105
19	Aldebaran	W.	90 46 46	3105	92 14 49	3106	93 42 51	3107	95 10 51	3108
	Pollux	W.	49 9 54	3179	50 36 28	3176	52 3 6	3173	53 29 47	3171
	Spica	E.	42 47 34	3085	41 19 6	3087	39 50 41	3089	38 22 18	3090
	Jupiter	E.	84 57 0	3143	83 29 43	3144	82 2 27	3146	80 35 13	3146
	Antares	E.	88 17 56	3086	86 49 29	3087	85 21 4	3088	83 52 40	3089
	Saturn	E.	110 8 8	3117	108 40 19	3118	107 12 32	3119	105 44 46	3120

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
12	VENUS	W.	119 13 19	3248	120 38 31	3259	122 3 31	3269	123 28 19	3279
	Fomalhaut	W.	106 47 6	3285	108 11 35	3301	109 35 45	3319	110 59 34	3339
	α Pegasi	W.	88 30 40	2900	90 2 59	2908	91 35 8	2917	93 7 5	2924
	α Arietis	W.	45 7 18	2817	46 41 24	2823	48 15 22	2828	49 49 13	2834
	Pollux	E.	31 59 7	2993	30 28 45	3023	28 59 1	3058	27 30 1	3093
	Regulus	E.	67 56 52	2787	66 22 7	2796	64 47 34	2805	63 13 12	2813
	Spica	E.	121 55 28	2770	120 20 21	2778	118 45 24	2786	117 10 38	2794
13	α Pegasi	W.	100 44 11	2969	102 15 2	2980	103 45 40	2989	105 16 7	2998
	α Arietis	W.	57 36 31	2866	59 9 33	2873	60 42 27	2879	62 15 13	2886
	Aldebaran	W.	24 59 30	2982	26 30 5	2973	28 0 51	2968	29 31 44	2965
	Regulus	E.	55 24 11	2857	53 50 57	2866	52 17 54	2875	50 45 2	2884
	Spica	E.	109 19 22	2833	107 45 37	2841	106 12 2	2848	104 38 36	2855
14	α Arietis	W.	69 56 55	2920	71 28 49	2926	73 0 35	2933	74 32 12	2940
	Aldebaran	W.	37 6 43	2964	38 37 41	2966	40 8 37	2969	41 39 28	2974
	Regulus	E.	43 3 41	2931	41 32 1	2940	40 0 33	2950	38 29 18	2961
	Spica	E.	96 53 54	2894	95 21 27	2900	93 49 8	2907	92 16 58	2915
15	α Arietis	W.	82 8 9	2973	83 38 55	2980	85 9 33	2986	86 40 3	2993
	Aldebaran	W.	49 12 30	2993	50 42 51	2998	52 13 6	3004	53 43 14	3008
	Regulus	E.	30 56 29	3020	29 26 41	3034	27 57 11	3049	26 27 59	3065
	Spica	E.	84 38 27	2950	83 7 11	2956	81 36 3	2963	80 5 4	2969
	JUPITER	E.	126 12 20	3014	124 42 25	3020	123 12 37	3026	121 42 57	3034
16	α Arietis	W.	94 10 33	3024	95 40 16	3030	97 9 51	3037	98 39 18	3042
	Aldebaran	W.	61 12 26	3033	62 41 58	3038	64 11 24	3043	65 40 44	3047
	Spica	E.	72 32 10	3001	71 1 58	3007	69 31 54	3013	68 1 57	3018
	JUPITER	E.	114 16 38	3064	112 47 44	3070	111 18 58	3075	109 50 18	3081
	Antares	E.	118 0 59	3008	116 30 56	3013	115 0 59	3018	113 31 9	3024
17	Aldebaran	W.	73 5 59	3070	74 34 45	3073	76 3 27	3077	77 32 5	3081
	Pollux	W.	31 57 53	3248	33 23 5	3236	34 48 31	3227	36 14 8	3219
	Spica	E.	60 33 53	3044	59 4 35	3049	57 35 23	3053	56 6 16	3057
	JUPITER	E.	102 28 37	3105	101 0 34	3110	99 32 37	3114	98 4 45	3119
	Antares	E.	106 3 36	3048	104 34 23	3052	103 5 15	3057	101 36 13	3060
	SATURN	E.	127 46 9	3079	126 17 34	3084	124 49 5	3088	123 20 41	3091
18	Aldebaran	W.	84 54 8	3097	86 22 21	3099	87 50 32	3101	89 18 40	3103
	Pollux	W.	43 24 14	3192	44 50 33	3188	46 16 56	3185	47 43 23	3182
	Spica	E.	48 41 54	3075	47 13 14	3078	45 44 38	3081	44 16 5	3083
	JUPITER	E.	90 46 32	3135	89 19 5	3138	87 51 41	3139	86 24 19	3141
	Antares	E.	94 12 8	3077	92 43 30	3080	91 14 56	3082	89 46 25	3084
	SATURN	E.	115 59 47	3109	114 31 48	3111	113 3 52	3114	111 35 59	3115
19	Aldebaran	W.	96 38 52	3109	98 6 51	3110	99 34 49	3110	101 2 47	3110
	Pollux	W.	54 56 30	3168	56 23 17	3165	57 50 8	3162	59 17 3	3159
	Spica	E.	36 53 56	3091	35 25 35	3092	33 57 16	3092	32 28 57	3092
	JUPITER	E.	79 7 59	3147	77 40 46	3147	76 13 33	3147	74 46 20	3145
	Antares	E.	82 24 17	3089	80 55 54	3089	79 27 32	3090	77 59 10	3090
	SATURN	E.	104 17 1	3121	102 49 17	3121	101 21 33	3120	99 53 48	3119

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
20	Aldebaran	W.	102 30 46	3108	103 58 46	3107	105 26 47	3105	106 54 50	3104
	Pollux	W.	60 44 1	3156	62 11 3	3153	63 38 9	3148	65 5 20	3144
	Regulus	W.	23 43 35	3189	25 9 57	3175	26 36 36	3165	28 3 27	3155
	Spica	E.	31 0 38	3092	29 32 19	3092	28 4 0	3092	26 35 41	3092
	JUPITER	E.	73 19 5	3144	71 51 49	3143	70 24 31	3141	68 57 11	3139
	Antares	E.	76 30 47	3088	75 2 23	3087	73 33 57	3085	72 5 29	3083
	SATURN	E.	98 26 2	3119	96 58 15	3117	95 30 26	3115	94 2 35	3113
	SUN	E.	128 18 15	3480	126 57 29	3479	125 36 42	3476	124 15 51	3474
21	Pollux	W.	72 22 30	3121	73 50 14	3115	75 18 5	3110	76 46 3	3103
	Regulus	W.	35 20 35	3110	36 48 32	3101	38 16 40	3094	39 44 57	3086
	JUPITER	E.	61 39 43	3121	60 11 59	3117	58 44 10	3111	57 16 14	3106
	Antares	E.	64 42 24	3067	63 13 34	3063	61 44 39	3057	60 15 37	3052
	SATURN	E.	86 42 29	3096	85 14 14	3091	83 45 53	3086	82 17 26	3080
	SUN	E.	117 30 46	3454	116 9 31	3449	114 48 10	3443	113 26 42	3438
22	Pollux	W.	84 7 57	3067	85 36 47	3058	87 5 48	3049	88 35 0	3040
	Regulus	W.	47 9 1	3041	48 38 23	3030	50 7 58	3021	51 37 45	3010
	JUPITER	E.	49 54 44	3072	48 26 0	3063	46 57 5	3055	45 28 0	3046
	Antares	E.	52 48 44	3021	51 18 57	3013	49 49 0	3005	48 18 53	2996
	SATURN	E.	74 53 17	3045	73 24 0	3037	71 54 33	3028	70 24 55	3018
	SUN	E.	106 37 30	3400	105 15 13	3390	103 52 45	3381	102 30 7	3371
23	Pollux	W.	96 4 0	2989	97 34 27	2977	99 5 9	2965	100 36 5	2954
	Regulus	W.	59 10 4	2953	60 41 16	2941	62 12 43	2927	63 44 27	2915
	JUPITER	E.	37 59 37	2994	36 29 17	2982	34 58 42	2970	33 27 53	2958
	Antares	E.	40 45 31	2949	39 14 14	2939	37 42 44	2928	36 11 0	2917
	SATURN	E.	62 53 41	2966	61 22 46	2954	59 51 35	2941	58 20 8	2929
	SUN	E.	95 33 52	3313	94 9 56	3301	92 45 46	3288	91 21 20	3274
24	Pollux	W.	108 14 43	2888	109 47 17	2875	111 20 8	2861	112 53 17	2847
	Regulus	W.	71 27 28	2843	73 1 0	2827	74 34 53	2811	76 9 6	2795
	Spica	W.	17 25 10	2858	18 58 23	2838	20 32 2	2818	22 6 7	2798
	SATURN	E.	50 38 42	2859	49 5 30	2843	47 31 58	2827	45 58 5	2811
	SUN	E.	84 14 58	3199	82 48 48	3183	81 22 18	3166	79 55 28	3148
25	Regulus	W.	84 5 34	2711	85 41 59	2693	87 18 48	2675	88 56 1	2657
	Spica	W.	30 2 42	2706	31 39 14	2687	33 16 12	2668	34 53 35	2649
	SATURN	E.	38 3 26	2728	36 27 23	2709	34 50 55	2692	33 14 4	2673
	SUN	E.	72 36 1	3059	71 7 1	3040	69 37 38	3022	68 7 52	3001
26	Regulus	W.	97 8 18	2565	98 48 1	2545	100 28 11	2527	102 8 47	2508
	Spica	W.	43 6 59	2553	44 46 59	2533	46 27 26	2513	48 8 20	2495
	SUN	E.	60 32 52	2904	59 0 38	2883	57 27 57	2863	55 54 51	2842
27	Regulus	W.	110 38 21	2415	112 21 34	2396	114 5 14	2378	115 49 20	2360
	Spica	W.	56 39 36	2398	58 23 14	2380	60 7 18	2361	61 51 50	2342
	JUPITER	W.	13 16 46	2489	14 58 15	2461	16 40 23	2434	18 23 9	2410
	SUN	E.	48 2 51	2744	46 27 10	2725	44 51 3	2706	43 14 31	2687
28	JUPITER	W.	27 4 53	2309	28 50 40	2289	30 36 56	2271	32 23 38	2254
	SUN	E.	35 5 50	2602	33 26 58	2588	31 47 45	2573	30 8 13	2559

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
20	Aldebaran	W.	108 22 55	3102	109 51 2	3100	111 19 12	3096	112 47 26	3093
	Pollux	W.	66 32 36	3140	67 59 57	3137	69 27 22	3132	70 54 53	3127
	Regulus	W.	29 30 30	3145	30 57 45	3136	32 25 11	3127	33 52 48	3119
	Spica	E.	25 7 21	3091	23 39 1	3091	22 10 41	3091	20 42 20	3090
	JUPITER	E.	67 29 49	3137	66 2 24	3133	64 34 55	3129	63 7 21	3126
	Antares	E.	70 36 59	3081	69 8 26	3078	67 39 49	3075	66 11 9	3071
	SATURN	E.	92 34 41	3110	91 6 44	3108	89 38 44	3104	88 10 39	3100
	SUN	E.	122 54 58	3471	121 34 1	3468	120 13 1	3463	118 51 56	3459
21	Pollux	W.	78 14 9	3096	79 42 23	3090	81 10 45	3082	82 39 16	3074
	Regulus	W.	41 13 24	3077	42 42 2	3069	44 10 50	3059	45 39 50	3050
	JUPITER	E.	55 48 12	3100	54 20 2	3094	52 51 45	3087	51 23 19	3079
	Antares	E.	58 46 29	3047	57 17 14	3041	55 47 52	3034	54 18 22	3028
	SATURN	E.	80 48 52	3074	79 20 11	3067	77 51 22	3060	76 22 24	3053
	SUN	E.	112 5 8	3431	110 43 26	3423	109 21 36	3416	107 59 38	3408
22	Pollux	W.	90 4 23	3030	91 33 58	3020	93 3 46	3010	94 33 46	2999
	Regulus	W.	53 7 45	2999	54 37 59	2989	56 8 26	2977	57 39 8	2965
	JUPITER	E.	43 58 44	3036	42 29 16	3026	40 59 36	3016	39 29 43	3005
	Antares	E.	46 48 35	2987	45 18 6	2979	43 47 27	2969	42 16 36	2959
	SATURN	E.	68 55 5	3009	67 25 4	2999	65 54 50	2988	64 24 22	2977
	SUN	E.	101 7 17	3360	99 44 15	3350	98 21 1	3338	96 57 34	3325
23	Pollux	W.	102 7 16	2941	103 38 43	2928	105 10 26	2915	106 42 26	2901
	Regulus	W.	65 16 27	2901	66 48 45	2887	68 21 21	2873	69 54 15	2858
	JUPITER	E.	31 56 48	2946	30 25 28	2933	28 53 51	2920	27 21 58	2907
	Antares	E.	34 39 3	2906	33 6 52	2894	31 34 26	2883	30 1 45	2873
	SATURN	E.	56 48 26	2916	55 16 27	2901	53 44 10	2887	52 11 35	2873
	SUN	E.	89 56 38	3259	88 31 39	3245	87 6 23	3230	85 40 49	3215
24	Pollux	W.	114 26 44	2832	116 0 30	2818	117 34 34	2803	119 8 58	2788
	Regulus	W.	77 43 40	2779	79 18 35	2763	80 53 52	2745	82 29 32	2729
	Spica	W.	23 40 37	2779	25 15 32	2761	26 50 51	2743	28 26 34	2724
	SATURN	E.	44 23 52	2795	42 49 18	2779	41 14 22	2763	39 39 5	2746
	SUN	E.	78 28 17	3132	77 0 46	3114	75 32 53	3096	74 4 38	3078
25	Regulus	W.	90 33 39	2639	92 11 41	2621	93 50 8	2602	95 29 0	2583
	Spica	W.	36 31 24	2630	38 9 38	2610	39 48 19	2591	41 27 26	2572
	SATURN	E.	31 36 48	2655	29 59 7	2636	28 21 1	2617	26 42 29	2599
	SUN	E.	66 37 41	2982	65 7 6	2962	63 36 6	2942	62 4 41	2924
26	Regulus	W.	103 49 49	2489	105 31 17	2470	107 13 12	2452	108 55 33	2433
	Spica	W.	49 49 40	2475	51 31 28	2456	53 13 43	2436	54 56 26	2417
	SUN	E.	54 21 18	2823	52 47 20	2803	51 12 56	2783	49 38 6	2764
27	Regulus	W.	117 33 52	2343	119 18 49	2326	121 4 11	2309	122 49 58	2292
	Spica	W.	63 36 49	2324	65 22 14	2305	67 8 6	2287	68 54 24	2269
	JUPITER	W.	20 6 30	2387	21 50 24	2366	23 34 47	2348	25 19 36	2329
	SUN	E.	41 37 34	2669	40 0 13	2652	38 22 28	2635	36 44 20	2618
28	JUPITER	W.	34 10 45	2237	35 58 17	2221	37 46 13	2206	39 34 32	2190
	SUN	E.	28 28 22	2547	26 48 14	2538	25 7 53	2530	23 27 22	2525

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	20 58 45.95	10.198	S. 17 8 22.1	+42.62	16 14.83	68.20	13 46.97	0.341
Frid.	2	21 2 50.28	10.163	16 51 10.3	43.36	16 14.68	68.09	13 54.72	0.306
Sat.	3	21 6 53.78	10.128	16 33 40.8	44.08	16 14.53	67.97	14 1.64	0.271
SUN.	4	21 10 56.44	10.093	16 15 54.4	+44.78	16 14.37	67.86	14 7.73	0.236
Mon.	5	21 14 58.27	10.058	15 57 51.1	45.47	16 14.21	67.74	14 12.99	0.201
Tues.	6	21 18 59.26	10.024	15 39 31.6	46.15	16 14.04	67.63	14 17.41	0.167
Wed.	7	21 22 59.42	9.990	15 20 56.1	+46.81	16 13.87	67.51	14 21.01	0.133
Thur.	8	21 26 58.76	9.956	15 2 5.1	47.45	16 13.70	67.39	14 23.78	0.099
Frid.	9	21 30 57.29	9.922	14 42 58.9	48.07	16 13.52	67.28	14 25.75	0.065
Sat.	10	21 34 55.01	9.888	14 23 38.2	+48.67	16 13.34	67.17	14 26.91	0.032
SUN.	11	21 38 51.93	9.856	14 4 3.2	49.25	16 13.15	67.06	14 27.28	0.001
Mon.	12	21 42 48.07	9.824	13 44 14.3	49.82	16 12.96	66.95	14 26.87	0.034
Tues.	13	21 46 43.45	9.792	13 24 11.9	+50.38	16 12.77	66.84	14 25.70	0.066
Wed.	14	21 50 38.06	9.761	13 3 56.4	50.92	16 12.58	66.73	14 23.76	0.098
Thur.	15	21 54 31.94	9.730	12 43 28.1	51.43	16 12.38	66.63	14 21.08	0.130
Frid.	16	21 58 25.09	9.700	12 22 47.6	+51.93	16 12.18	66.52	14 17.68	0.159
Sat.	17	22 2 17.52	9.671	12 1 55.2	52.42	16 11.97	66.42	14 13.57	0.187
SUN.	18	22 6 9.25	9.642	11 40 51.4	52.89	16 11.76	66.32	14 8.77	0.215
Mon.	19	22 10 0.31	9.614	11 19 36.3	+53.35	16 11.55	66.23	14 3.28	0.242
Tues.	20	22 13 50.71	9.587	10 58 10.5	53.79	16 11.34	66.13	13 57.15	0.269
Wed.	21	22 17 40.45	9.561	10 36 34.6	54.21	16 11.12	66.04	13 50.35	0.295
Thur.	22	22 21 29.55	9.535	10 14 48.7	+54.61	16 10.90	65.95	13 42.93	0.321
Frid.	23	22 25 18.05	9.510	9 52 53.2	55.00	16 10.68	65.86	13 34.90	0.346
Sat.	24	22 29 5.95	9.485	9 30 48.6	55.37	16 10.45	65.77	13 26.28	0.370
SUN.	25	22 32 53.27	9.461	9 8 35.5	+55.72	16 10.22	65.68	13 17.06	0.394
Mon.	26	22 36 40.02	9.438	8 46 14.1	56.06	16 9.98	65.60	13 7.29	0.418
Tues.	27	22 40 26.22	9.415	8 23 44.8	56.38	16 9.74	65.52	12 56.96	0.441
Wed.	28	22 44 11.88	9.393	8 1 8.1	56.68	16 9.50	65.44	12 46.09	0.463
Thur.	29	22 47 57.02	9.371	S. 7 38 24.5	+56.96	16 9.26	65.37	12 34.70	0.485

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.18 from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	20 58 43.61	10.198	S. 17 8 31.9	+42.61	13 46.89	0.341	20 44 56.72
Frid.	2	21 2 47.93	10.163	16 51 20.4	43.35	13 54.65	0.306	20 48 53.28
Sat.	3	21 6 51.42	10.128	16 33 51.2	44.07	14 1.58	0.271	20 52 49.83
SUN.	4	21 10 54.07	10.093	16 16 5.0	+44.77	14 7.68	0.236	20 56 46.39
Mon.	5	21 14 55.89	10.058	15 58 1.9	45.46	14 12.94	0.201	21 0 42.94
Tues.	6	21 18 56.87	10.024	15 39 42.6	46.14	14 17.37	0.167	21 4 39.50
Wed.	7	21 22 57.03	9.990	15 21 7.3	+46.80	14 20.98	0.133	21 8 36.06
Thur.	8	21 26 56.37	9.956	15 2 16.5	47.44	14 23.76	0.099	21 12 32.61
Frid.	9	21 30 54.90	9.922	14 43 10.5	48.06	14 25.73	0.065	21 16 29.16
Sat.	10	21 34 52.62	9.888	14 23 50.0	+48.66	14 26.90	0.032	21 20 25.72
SUN.	11	21 38 49.55	9.856	14 4 15.1	49.24	14 27.28	0.001	21 24 22.27
Mon.	12	21 42 45.70	9.824	13 44 26.3	49.81	14 26.88	0.034	21 28 18.83
Tues.	13	21 46 41.09	9.792	13 24 24.0	+50.37	14 25.71	0.066	21 32 15.38
Wed.	14	21 50 35.71	9.761	13 4 8.6	50.91	14 23.78	0.098	21 36 11.94
Thur.	15	21 54 29.60	9.730	12 43 40.4	51.43	14 21.11	0.130	21 40 8.49
Frid.	16	21 58 22.77	9.700	12 23 0.0	+51.93	14 17.72	0.159	21 44 5.05
Sat.	17	22 2 15.22	9.671	12 2 7.6	52.42	14 13.61	0.187	21 48 1.60
SUN.	18	22 6 6.97	9.642	11 41 3.8	52.89	14 8.82	0.215	21 51 58.16
Mon.	19	22 9 58.05	9.614	11 19 48.8	+53.35	14 3.34	0.242	21 55 54.71
Tues.	20	22 13 48.47	9.587	10 58 23.0	53.79	13 57.21	0.269	21 59 51.26
Wed.	21	22 17 38.24	9.561	10 36 46.9	54.21	13 50.42	0.295	22 3 47.82
Thur.	22	22 21 27.37	9.535	10 15 1.0	+54.61	13 43.00	0.321	22 7 44.37
Frid.	23	22 25 15.90	9.510	9 53 5.6	55.00	13 34.98	0.346	22 11 40.92
Sat.	24	22 29 3.83	9.485	9 31 1.0	55.37	13 26.36	0.370	22 15 37.48
SUN.	25	22 32 51.18	9.461	9 8 47.8	+55.72	13 17.15	0.394	22 19 34.03
Mon.	26	22 36 37.96	9.438	8 46 26.3	56.06	13 7.38	0.418	22 23 30.58
Tues.	27	22 40 24.19	9.416	8 23 56.9	56.38	12 57.05	0.441	22 27 27.14
Wed.	28	22 44 9.88	9.393	8 1 20.1	56.68	12 46.19	0.463	22 31 23.69
Thur.	29	22 47 55.05	9.371	S. 7 38 36.4	+56.96	12 34.80	0.485	22 35 20.24

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour, +9ˢ.8565. (Table III.)

AT GREENWICH MEAN NOON.								
		THE SUN'S						
Day of the Month.	Day of the Year.	TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	32	312 13 19.2	12 56.6	152.25	+ 0.68	9.9936948	+26.9	3 14 31.32
2	33	313 14 12.5	13 49.8	152.19	0.71	9.9937599	27.4	3 10 35.41
3	34	314 15 4.5	14 41.6	152.14	0.71	9.9938263	28.0	3 6 39.50
4	35	315 15 55.1	15 32.1	152.08	+ 0.66	9.9938941	+28.6	3 2 43.59
5	36	316 16 44.2	16 21.1	152.02	0.58	9.9939635	29.3	2 58 47.68
6	37	317 17 31.8	17 8.5	151.95	0.50	9.9940345	30.0	2 54 51.77
7	38	318 18 17.8	17 54.4	151.89	+ 0.38	9.9941073	+30.7	2 50 55.86
8	39	319 19 2.2	18 38.7	151.82	0.25	9.9941820	31.5	2 46 59.96
9	40	320 19 45.1	19 21.4	151.76	+ 0.12	9.9942587	32.3	2 43 4.05
10	41	321 20 26.4	20 2.6	151.69	0.00	9.9943374	+33.2	2 39 8.14
11	42	322 21 6.1	20 42.1	151.63	− 0.11	9.9944182	34.1	2 35 12.23
12	43	323 21 44.2	21 20.2	151.56	0.22	9.9945012	35.0	2 31 16.32
13	44	324 22 20.8	21 56.6	151.50	− 0.30	9.9945863	+35.9	2 27 20.41
14	45	325 22 55.9	22 31.6	151.43	0.36	9.9946735	36.8	2 23 24.50
15	46	326 23 29.6	23 5.1	151.37	0.40	9.9947629	37.7	2 19 28.60
16	47	327 24 1.7	23 37.2	151.31	− 0.42	9.9948543	+38.5	2 15 32.69
17	48	328 24 32.4	24 7.8	151.25	0.40	9.9949478	39.3	2 11 36.78
18	49	329 25 1.7	24 37.0	151.19	0.35	9.9950432	40.1	2 7 40.87
19	50	330 25 29.6	25 4.7	151.13	− 0.29	9.9951405	+40.9	2 3 44.96
20	51	331 25 56.2	25 31.2	151.08	0.19	9.9952396	41.6	1 59 49.06
21	52	332 26 21.3	25 56.2	151.02	− 0.07	9.9953403	42.3	1 55 53.15
22	53	333 26 45.1	26 19.8	150.96	+ 0.06	9.9954425	+42.9	1 51 57.25
23	54	334 27 7.5	26 42.1	150.90	0.18	9.9955461	43.4	1 48 1.33
24	55	335 27 28.5	27 3.0	150.84	0.31	9.9956509	43.9	1 44 5.42
25	56	336 27 48.0	27 22.5	150.78	+ 0.43	9.9957567	+44.3	1 40 9.52
26	57	337 28 6.1	27 40.4	150.72	0.55	9.9958634	44.6	1 36 13.61
27	58	338 28 22.6	27 56.9	150.66	0.64	9.9959708	44.9	1 32 17.70
28	59	339 28 37.6	28 11.7	150.59	0.70	9.9960787	45.1	1 28 21.80
29	60	340 28 50.8	28 24.8	150.52	+ 0.73	9.9961871	+45.3	1 24 25.89

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 41.3	16 39.4	61 8.3	−0.39	61 1.3	−0.75	1 29.8	2.26	1.4
2	16 36.3	16 32.2	60 50.1	1.09	60 35.1	1.38	2 23.4	2.21	2.4
3	16 27.3	16 21.6	60 16.8	1.63	59 56.0	1.82	3 16.0	2.19	3.4
4	16 15.4	16 8.8	59 33.2	−1.95	59 9.0	−2.04	4 8.5	2.19	4.4
5	16 2.0	15 55.2	58 44.2	2.08	58 19.1	2.08	5 1.3	2.21	5.4
6	15 48.5	15 41.9	57 54.3	2.04	57 30.0	1.98	5 54.8	2.24	6.4
7	15 35.5	15 29.5	57 6.7	−1.89	56 44.6	−1.80	6 48.6	2.24	7.4
8	15 23.8	15 18.5	56 23.7	1.68	56 4.3	1.55	7 42.2	2.22	8.4
9	15 13.6	15 9.1	55 46.4	1.43	55 29.9	1.31	8 34.8	2.16	9.4
10	15 5.0	15 1.4	55 14.8	−1.19	55 1.3	−1.07	9 25.5	2.07	10.4
11	14 58.0	14 55.1	54 49.1	0.95	54 38.3	0.85	10 14.0	1.97	11.4
12	14 52.5	14 50.3	54 28.8	0.74	54 20.6	0.63	11 0.0	1.87	12.4
13	14 48.4	14 46.8	54 13.6	−0.53	54 7.8	−0.43	11 43.8	1.79	13.4
14	14 45.5	14 44.6	54 3.2	0.33	53 59.8	0.23	12 26.0	1.73	14.4
15	14 44.0	14 43.8	53 57.7	−0.12	53 56.9	−0.01	13 7.1	1.70	15.4
16	14 44.0	14 44.5	53 57.5	+0.11	53 59.5	+0.23	13 47.9	1.70	16.4
17	14 45.5	14 47.0	54 3.1	0.37	54 8.4	0.51	14 29.2	1.74	17.4
18	14 48.9	14 51.3	54 15.5	0.67	54 24.4	0.82	15 11.7	1.81	18.4
19	14 54.3	14 57.8	54 35.2	+0.98	54 48.1	+1.16	15 56.1	1.90	19.4
20	15 1.9	15 6.5	55 3.1	1.33	55 20.1	1.51	16 43.3	2.03	20.4
21	15 11.7	15 17.5	55 39.3	1.68	56 0.6	1.85	17 33.5	2.16	21.4
22	15 23.8	15 30.6	56 23.8	+2.01	56 48.8	+2.15	18 26.7	2.28	22.4
23	15 37.9	15 45.4	57 15.4	2.26	57 43.2	2.35	19 22.6	2.37	23.4
24	15 53.2	16 1.1	58 11.8	2.40	58 40.7	2.40	20 20.1	2.41	24.4
25	16 8.9	16 16.5	59 9.4	+2.35	59 37.2	+2.25	21 18.0	2.40	25.4
26	16 23.6	16 30.1	60 3.4	2.08	60 27.2	1.85	22 15.3	2.37	26.4
27	16 35.8	16 40.4	60 48.0	1.57	61 4.9	1.23	23 11.5	2.32	27.4
28	16 43.8	16 45.9	61 17.5	+0.85	61 25.3	+0.43	☌		28.4
29	16 46.7	16 45.9	61 28.0	0.00	61 25.4	−0.43	0 6.6	2.28	0.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	22 11 26.84	2.3491	S. 5 57 34.3	14.332
1	22 13 47.71	2.3465	5 43 13.4	14.364
2	22 16 8.42	2.3439	5 28 50.6	14.394
3	22 18 28.98	2.3413	5 14 26.1	14.422
4	22 20 49.38	2.3388	4 59 59.9	14.450
5	22 23 9.64	2.3364	4 45 32.1	14.475
6	22 25 29.75	2.3339	4 31 2.9	14.498
7	22 27 49.71	2.3315	4 16 32.3	14.520
8	22 30 9.53	2.3292	4 2 0.5	14.539
9	22 32 29.21	2.3268	3 47 27.6	14.557
10	22 34 48.75	2.3246	3 32 53.7	14.572
11	22 37 8.16	2.3224	3 18 18.9	14.587
12	22 39 27.44	2.3202	3 3 43.3	14.599
13	22 41 46.59	2.3181	2 49 7.0	14.610
14	22 44 5.61	2.3160	2 34 30.1	14.619
15	22 46 24.51	2.3139	2 19 52.7	14.626
16	22 48 43.28	2.3119	2 5 15.0	14.631
17	22 51 1.94	2.3100	1 50 36.9	14.635
18	22 53 20.48	2.3081	1 35 58.7	14.637
19	22 55 38.91	2.3062	1 21 20.5	14.636
20	22 57 57.23	2.3045	1 6 42.4	14.634
21	23 0 15.45	2.3027	0 52 4.4	14.632
22	23 2 33.56	2.3010	0 37 26.6	14.627
23	23 4 51.57	2.2993	S. 0 22 49.2	14.620

FRIDAY 2.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	23 7 9.48	2.2977	S. 0 8 12.2	14.612
1	23 9 27.30	2.2962	N. 0 6 24.2	14.601
2	23 11 45.02	2.2947	0 20 59.9	14.589
3	23 14 2.66	2.2932	0 35 34.9	14.576
4	23 16 20.21	2.2917	0 50 9.0	14.560
5	23 18 37.67	2.2904	1 4 42.1	14.543
6	23 20 55.06	2.2892	1 19 14.2	14.526
7	23 23 12.37	2.2878	1 33 45.2	14.506
8	23 25 29.60	2.2866	1 48 14.9	14.483
9	23 27 46.76	2.2855	2 2 43.2	14.460
10	23 30 3.86	2.2844	2 17 10.1	14.436
11	23 32 20.89	2.2833	2 31 35.5	14.410
12	23 34 37.86	2.2823	2 45 59.3	14.382
13	23 36 54.77	2.2813	3 0 21.3	14.352
14	23 39 11.62	2.2804	3 14 41.5	14.320
15	23 41 28.42	2.2796	3 28 59.7	14.287
16	23 43 45.17	2.2787	3 43 16.0	14.253
17	23 46 1.87	2.2780	3 57 30.1	14.217
18	23 48 18.53	2.2772	4 11 42.1	14.181
19	23 50 35.14	2.2765	4 25 51.8	14.142
20	23 52 51.71	2.2759	4 39 59.1	14.102
21	23 55 8.25	2.2753	4 54 4.0	14.060
22	23 57 24.75	2.2748	5 8 6.3	14.017
23	23 59 41.23	2.2743	5 22 6.0	13.972
24	0 1 57.67	2.2738	N. 5 36 3.0	13.927

SATURDAY 3.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 1 57.67	2.2738	N. 5 36 3.0	13.927
1	0 4 14.09	2.2735	5 49 57.2	13.879
2	0 6 30.49	2.2732	6 3 48.5	13.830
3	0 8 46.87	2.2729	6 17 36.8	13.779
4	0 11 3.24	2.2727	6 31 22.0	13.727
5	0 13 19.59	2.2724	6 45 4.1	13.675
6	0 15 35.93	2.2722	6 58 43.0	13.620
7	0 17 52.26	2.2721	7 12 18.5	13.564
8	0 20 8.58	2.2720	7 25 50.7	13.507
9	0 22 24.90	2.2719	7 39 19.4	13.449
10	0 24 41.21	2.2719	7 52 44.6	13.389
11	0 26 57.53	2.2720	8 6 6.1	13.327
12	0 29 13.85	2.2721	8 19 23.9	13.265
13	0 31 30.18	2.2722	8 32 37.9	13.202
14	0 33 46.51	2.2723	8 45 48.1	13.137
15	0 36 2.86	2.2726	8 58 54.3	13.070
16	0 38 19.22	2.2728	9 11 56.5	13.003
17	0 40 35.59	2.2730	9 24 54.6	12.934
18	0 42 51.98	2.2733	9 37 48.9	12.864
19	0 45 8.39	2.2737	9 50 38.3	12.793
20	0 47 24.82	2.2741	10 3 23.8	12.722
21	0 49 41.28	2.2745	10 16 4.9	12.648
22	0 51 57.76	2.2749	10 28 41.5	12.572
23	0 54 14.27	2.2754	N. 10 41 13.6	12.497

SUNDAY 4.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 56 30.81	2.2759	N. 10 53 41.2	12.421
1	0 58 47.38	2.2764	11 6 4.1	12.342
2	1 1 3.98	2.2770	11 18 22.2	12.262
3	1 3 20.62	2.2777	11 30 35.6	12.182
4	1 5 37.30	2.2783	11 42 44.1	12.101
5	1 7 54.01	2.2788	11 54 47.7	12.018
6	1 10 10.76	2.2796	12 6 46.4	11.934
7	1 12 27.56	2.2803	12 18 39.9	11.850
8	1 14 44.40	2.2810	12 30 28.4	11.765
9	1 17 1.28	2.2817	12 42 11.7	11.677
10	1 19 18.21	2.2825	12 53 49.7	11.590
11	1 21 35.18	2.2833	13 5 22.5	11.502
12	1 23 52.21	2.2842	13 16 49.9	11.412
13	1 26 9.28	2.2849	13 28 11.9	11.321
14	1 28 26.40	2.2858	13 39 28.4	11.228
15	1 30 43.58	2.2867	13 50 39.3	11.136
16	1 33 0.81	2.2876	14 1 44.7	11.042
17	1 35 18.09	2.2885	14 12 44.4	10.947
18	1 37 35.43	2.2894	14 23 38.4	10.852
19	1 39 52.82	2.2902	14 34 26.7	10.757
20	1 42 10.26	2.2912	14 45 9.2	10.659
21	1 44 27.76	[illegible]	14 55 45.8	10.560
22	1 46 45.32	2.2932	15 6 16.4	10.461
23	1 49 2.94	2.2942	15 16 41.1	10.362
24	1 51 20.62	2.2952	N. 15 26 59.8	10.261

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 5.					WEDNESDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 51 20.62	2.2952	N.15 26 59.8	10.261	0	3 42 30.05	2.3283	N.21 30 28.1	4.685
1	1 53 38.36	2.2962	15 37 12.4	10.159	1	3 44 49.75	2.3283	21 35 5.4	4.558
2	1 55 56.16	2.2971	15 47 18.9	10.057	2	3 47 9.45	2.3283	21 39 35.1	4.432
3	1 58 14.01	2.2981	15 57 19.3	9.954	3	3 49 29.15	2.3282	21 43 57.2	4.305
4	2 0 31.93	2.2991	16 7 13.4	9.850	4	3 51 48.84	2.3280	21 48 11.7	4.179
5	2 2 49.90	2.3001	16 17 1.3	9.745	5	3 54 8.51	2.3278	21 52 18.7	4.052
6	2 5 7.94	2.3012	16 26 42.8	9.639	6	3 56 28.17	2.3276	21 56 18.0	3.925
7	2 7 26.04	2.3021	16 36 18.0	9.533	7	3 58 47.82	2.3272	22 0 9.7	3.798
8	2 9 44.19	2.3030	16 45 46.8	9.427	8	4 1 7.44	2.3268	22 3 53.8	3.672
9	2 12 2.40	2.3040	16 55 9.2	9.319	9	4 3 27.04	2.3264	22 7 30.3	3.544
10	2 14 20.67	2.3050	17 4 25.1	9.210	10	4 5 46.61	2.3259	22 10 59.2	3.417
11	2 16 39.00	2.3059	17 13 34.4	9.100	11	4 8 6.15	2.3254	22 14 20.4	3.290
12	2 18 57.38	2.3069	17 22 37.1	8.990	12	4 10 25.66	2.3248	22 17 34.0	3.162
13	2 21 15.83	2.3080	17 31 33.2	8.880	13	4 12 45.13	2.3242	22 20 39.9	3.035
14	2 23 34.34	2.3089	17 40 22.7	8.769	14	4 15 4.57	2.3236	22 23 38.2	2.908
15	2 25 52.90	2.3098	17 49 5.5	8.657	15	4 17 23.96	2.3228	22 26 28.9	2.781
16	2 28 11.52	2.3108	17 57 41.5	8.544	16	4 19 43.31	2.3221	22 29 11.9	2.653
17	2 30 30.20	2.3117	18 6 10.8	8.431	17	4 22 2.61	2.3212	22 31 47.3	2.527
18	2 32 48.93	2.3126	18 14 33.2	8.317	18	4 24 21.86	2.3204	22 34 15.1	2.400
19	2 35 7.71	2.3135	18 22 48.8	8.202	19	4 26 41.06	2.3195	22 36 35.3	2.272
20	2 37 26.55	2.3144	18 30 57.5	8.087	20	4 29 0.20	2.3184	22 38 47.8	2.145
21	2 39 45.44	2.3153	18 38 59.3	7.972	21	4 31 19.27	2.3173	22 40 52.7	2.018
22	2 42 4.39	2.3162	18 46 54.1	7.856	22	4 33 38.28	2.3163	22 42 50.0	1.892
23	2 44 23.39	2.3170	N.18 54 42.1	7.739	23	4 35 57.23	2.3152	N.22 44 39.7	1.765
	TUESDAY 6.					THURSDAY 8.			
0	2 46 42.43	2.3177	N.19 2 22.9	7.622	0	4 38 16.10	2.3139	N.22 46 21.8	1.638
1	2 49 1.52	2.3186	19 9 56.7	7.504	1	4 40 34.90	2.3127	22 47 56.3	1.512
2	2 51 20.66	2.3194	19 17 23.4	7.386	2	4 42 53.62	2.3113	22 49 23.2	1.386
3	2 53 39.85	2.3202	19 24 43.0	7.267	3	4 45 12.26	2.3100	22 50 42.6	1.260
4	2 55 59.08	2.3208	19 31 55.5	7.148	4	4 47 30.82	2.3086	22 51 54.4	1.134
5	2 58 18.35	2.3215	19 39 0.8	7.028	5	4 49 49.29	2.3071	22 52 58.7	1.008
6	3 0 37.66	2.3222	19 45 58.9	6.908	6	4 52 7.67	2.3055	22 53 55.4	0.882
7	3 2 57.01	2.3228	19 52 49.8	6.787	7	4 54 25.95	2.3039	22 54 44.6	0.757
8	3 5 16.40	2.3234	19 59 33.4	6.666	8	4 56 44.14	2.3023	22 55 26.3	0.632
9	3 7 35.82	2.3240	20 6 9.7	6.545	9	4 59 2.23	2.3007	22 56 0.5	0.508
10	3 9 55.28	2.3246	20 12 38.8	6.424	10	5 1 20.22	2.2989	22 56 27.3	0.384
11	3 12 14.77	2.3251	20 19 0.6	6.302	11	5 3 38.10	2.2971	22 56 46.6	0.260
12	3 14 34.29	2.3256	20 25 15.0	6.178	12	5 5 55.87	2.2952	22 56 58.5	0.136
13	3 16 53.84	2.3260	20 31 22.0	6.056	13	5 8 13.52	2.2932	22 57 2.9	+ 0.012
14	3 19 13.41	2.3264	20 37 21.7	5.933	14	5 10 31.06	2.2913	22 56 59.9	− 0.111
15	3 21 33.01	2.3268	20 43 14.0	5.808	15	5 12 48.48	2.2893	22 56 49.6	0.233
16	3 23 52.63	2.3271	20 48 58.8	5.685	16	5 15 5.78	2.2872	22 56 31.9	0.357
17	3 26 12.26	2.3273	20 54 36.2	5.561	17	5 17 22.95	2.2851	22 56 6.8	0.479
18	3 28 31.91	2.3277	21 0 6.1	5.436	18	5 19 39.99	2.2829	22 55 34.4	0.601
19	3 30 51.58	2.3279	21 5 28.5	5.312	19	5 21 56.90	2.2807	22 54 54.7	0.722
20	3 33 11.26	2.3281	21 10 43.5	5.187	20	5 24 13.67	2.2784	22 54 7.7	0.843
21	3 35 30.95	2.3282	21 15 50.9	5.061	21	5 26 30.31	2.2761	22 53 13.5	0.963
22	3 37 50.65	2.3283	21 20 50.8	4.936	22	5 28 46.80	2.2737	22 52 12.1	1.084
23	3 40 10.35	2.3283	21 25 43.2	4.811	23	5 31 3.15	2.2713	22 51 3.4	1.204
24	3 42 30.05	2.3283	N.21 30 28.1	4.685	24	5 33 19.36	2.2689	N.22 49 47.6	1.323

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 9.					SUNDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 33 19.36	2.2689	N.22 49 47.6	1.323	0	7 18 37.96	2.1082	N.19 39 7.8	6.372
1	5 35 35.42	2.2663	22 48 24.6	1.442	1	7 20 44.34	2.1044	19 32 42.8	6.461
2	5 37 51.32	2.2637	22 46 54.5	1.561	2	7 22 50.49	2.1006	19 26 12.5	6.549
3	5 40 7.07	2.2612	22 45 17.3	1.679	3	7 24 56.41	2.0967	19 19 36.9	6.636
4	5 42 22.66	2.2585	22 43 33.0	1.797	4	7 27 2.09	2.0928	19 12 56.2	6.722
5	5 44 38.09	2.2557	22 41 41.7	1.914	5	7 29 7.55	2.0890	19 6 10.3	6.807
6	5 46 53.35	2.2530	22 39 43.3	2.031	6	7 31 12.77	2.0852	18 59 19.4	6.891
7	5 49 8.45	2.2502	22 37 38.0	2.146	7	7 33 17.77	2.0813	18 52 23.4	6.975
8	5 51 23.38	2.2474	22 35 25.8	2.262	8	7 35 22.53	2.0774	18 45 22.4	7.057
9	5 53 38.14	2.2445	22 33 6.6	2.377	9	7 37 27.06	2.0736	18 38 16.5	7.139
10	5 55 52.72	2.2415	22 30 40.5	2.492	10	7 39 31.36	2.0698	18 31 5.7	7.221
11	5 58 7.12	2.2385	22 28 7.6	2.606	11	7 41 35.44	2.0660	18 23 50.0	7.301
12	6 0 21.34	2.2355	22 25 27.8	2.719	12	7 43 39.28	2.0621	18 16 29.6	7.380
13	6 2 35.38	2.2325	22 22 41.3	2.832	13	7 45 42.89	2.0583	18 9 4.4	7.459
14	6 4 49.24	2.2294	22 19 48.0	2.945	14	7 47 46.28	2.0545	18 1 34.5	7.537
15	6 7 2.91	2.2263	22 16 47.9	3.057	15	7 49 49.43	2.0506	17 53 59.9	7.615
16	6 9 16.40	2.2232	22 13 41.2	3.167	16	7 51 52.35	2.0468	17 46 20.7	7.691
17	6 11 29.70	2.2200	22 10 27.9	3.277	17	7 53 55.05	2.0431	17 38 37.0	7.767
18	6 13 42.80	2.2167	22 7 7.9	3.387	18	7 55 57.52	2.0393	17 30 48.7	7.842
19	6 15 55.71	2.2135	22 3 41.4	3.497	19	7 57 59.77	2.0356	17 22 55.9	7.916
20	6 18 8.42	2.2102	22 0 8.3	3.606	20	8 0 1.79	2.0318	17 14 58.7	7.989
21	6 20 20.93	2.2068	21 56 28.7	3.714	21	8 2 3.59	2.0281	17 6 57.2	8.062
22	6 22 33.24	2.2035	21 52 42.6	3.822	22	8 4 5.16	2.0243	16 58 51.3	8.134
23	6 24 45.35	2.2001	N.21 48 50.1	3.928	23	8 6 6.51	2.0206	N.16 50 41.1	8.205
	SATURDAY 10.					MONDAY 12.			
0	6 26 57.25	2.1967	N.21 44 51.2	4.034	0	8 8 7.63	2.0169	N.16 42 26.7	8.275
1	6 29 8.95	2.1932	21 40 46.0	4.140	1	8 10 8.54	2.0132	16 34 8.1	8.344
2	6 31 20.44	2.1897	21 36 34.4	4.245	2	8 12 9.22	2.0095	16 25 45.4	8.412
3	6 33 31.72	2.1862	21 32 16.6	4.349	3	8 14 9.68	2.0059	16 17 18.7	8.479
4	6 35 42.79	2.1827	21 27 52.5	4.453	4	8 16 9.93	2.0023	16 8 47.9	8.547
5	6 37 53.64	2.1791	21 23 22.2	4.556	5	8 18 9.96	1.9987	16 0 13.1	8.613
6	6 40 4.28	2.1756	21 18 45.8	4.657	6	8 20 9.78	1.9952	15 51 34.3	8.678
7	6 42 14.71	2.1720	21 14 3.3	4.758	7	8 22 9.38	1.9915	15 42 51.7	8.742
8	6 44 24.92	2.1684	21 9 14.8	4.859	8	8 24 8.76	1.9879	15 34 5.2	8.807
9	6 46 34.92	2.1647	21 4 20.2	4.960	9	8 26 7.93	1.9845	15 25 14.9	8.870
10	6 48 44.69	2.1610	20 59 19.6	5.059	10	8 28 6.90	1.9810	15 16 20.8	8.932
11	6 50 54.24	2.1573	20 54 13.1	5.158	11	8 30 5.65	1.9774	15 7 23.0	8.993
12	6 53 3.57	2.1537	20 49 0.7	5.256	12	8 32 4.19	1.9740	14 58 21.6	9.053
13	6 55 12.68	2.1500	20 43 42.4	5.352	13	8 34 2.53	1.9706	14 49 16.6	9.113
14	6 57 21.57	2.1462	20 38 18.4	5.449	14	8 36 0.66	1.9672	14 40 8.0	9.172
15	6 59 30.23	2.1424	20 32 48.5	5.545	15	8 37 58.59	1.9637	14 30 55.9	9.231
16	7 1 38.66	2.1387	20 27 13.0	5.640	16	8 39 56.31	1.9604	14 21 40.3	9.288
17	7 3 46.87	2.1350	20 21 31.7	5.735	17	8 41 53.84	1.9572	14 12 21.3	9.345
18	7 5 54.86	2.1312	20 15 44.8	5.827	18	8 43 51.17	1.9538	14 2 58.9	9.401
19	7 8 2.61	2.1273	20 9 52.4	5.920	19	8 45 48.30	1.9506	13 53 33.2	9.456
20	7 10 10.14	2.1236	20 3 54.4	6.012	20	8 47 45.24	1.9473	13 44 4.2	9.510
21	7 12 17.44	2.1197	19 57 50.9	6.104	21	8 49 41.98	1.9441	13 34 32.0	9.563
22	7 14 24.51	2.1159	19 51 41.9	6.195	22	8 51 38.53	1.9409	13 24 56.6	9.616
23	7 16 31.35	2.1121	19 45 27.5	6.284	23	8 53 34.89	1.9378	13 15 18.1	9.667
24	7 18 37.96	2.1082	N.19 39 7.8	6.372	24	8 55 31.07	1.9347	N.13 5 36.5	9.719

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 13.					THURSDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 55 31.07	1.9347	N. 13 5 36.5	9.719	0	10 25 29.32	1.8299	N. 4 34 23.8	11.301
1	8 57 27.06	1.9316	12 55 51.8	9.770	1	10 27 19.08	1.8287	4 23 5.3	11.317
2	8 59 22.86	1.9285	12 46 4.1	9.819	2	10 29 8.77	1.8276	4 11 45.8	11.332
3	9 1 18.48	1.9255	12 36 13.5	9.867	3	10 30 58.39	1.8266	4 0 25.5	11.345
4	9 3 13.92	1.9226	12 26 20.0	9.916	4	10 32 47.96	1.8257	3 49 4.4	11.358
5	9 5 9.19	1.9197	12 16 23.6	9.964	5	10 34 37.47	1.8247	3 37 42.5	11.371
6	9 7 4.28	1.9167	12 6 24.3	10.011	6	10 36 26.93	1.8238	3 26 19.9	11.383
7	9 8 59.19	1.9137	11 56 22.3	10.057	7	10 38 16.33	1.8230	3 14 56.5	11.396
8	9 10 53.93	1.9109	11 46 17.5	10.102	8	10 40 5.69	1.8222	3 3 32.4	11.407
9	9 12 48.50	1.9081	11 36 10.1	10.146	9	10 41 54.99	1.8214	2 52 7.7	11.416
10	9 14 42.90	1.9053	11 26 0.0	10.189	10	10 43 44.26	1.8208	2 40 42.5	11.425
11	9 16 37.14	1.9027	11 15 47.3	10.232	11	10 45 33.49	1.8202	2 29 16.7	11.433
12	9 18 31.22	1.8999	11 5 32.1	10.274	12	10 47 22.68	1.8196	2 17 50.5	11.441
13	9 20 25.13	1.8972	10 55 14.4	10.315	13	10 49 11.84	1.8190	2 6 23.8	11.449
14	9 22 18.89	1.8947	10 44 54.3	10.356	14	10 51 0.96	1.8184	1 54 56.5	11.456
15	9 24 12.49	1.8920	10 34 31.7	10.396	15	10 52 50.05	1.8180	1 43 29.0	11.462
16	9 26 5.93	1.8894	10 24 6.8	10.435	16	10 54 39.12	1.8177	1 32 1.1	11.467
17	9 27 59.22	1.8869	10 13 39.5	10.473	17	10 56 28.17	1.8173	1 20 32.9	11.472
18	9 29 52.36	1.8845	10 3 10.0	10.510	18	10 58 17.20	1.8170	1 9 4.5	11.476
19	9 31 45.36	1.8821	9 52 38.3	10.547	19	11 0 6.21	1.8167	0 57 35.8	11.479
20	9 33 38.21	1.8797	9 42 4.4	10.583	20	11 1 55.21	1.8165	0 46 7.0	11.482
21	9 35 30.92	1.8772	9 31 28.3	10.618	21	11 3 44.19	1.8163	0 34 38.0	11.483
22	9 37 23.48	1.8749	9 20 50.2	10.652	22	11 5 33.17	1.8162	0 23 9.0	11.484
23	9 39 15.91	1.8727	N. 9 10 10.0	10.687	23	11 7 22.14	1.8162	N. 0 11 39.9	11.486
	WEDNESDAY 14.					FRIDAY 16.			
0	9 41 8.20	1.8704	N. 8 59 27.8	10.720	0	11 9 11.11	1.8162	N. 0 0 10.7	11.486
1	9 43 0.36	1.8682	8 48 43.6	10.752	1	11 11 0.08	1.8162	S. 0 11 18.4	11.485
2	9 44 52.39	1.8661	8 37 57.5	10.783	2	11 12 49.06	1.8163	0 22 47.5	11.484
3	9 46 44.29	1.8640	8 27 9.6	10.814	3	11 14 38.04	1.8165	0 34 16.5	11.482
4	9 48 36.07	1.8619	8 16 19.8	10.845	4	11 16 27.04	1.8167	0 45 45.3	11.479
5	9 50 27.72	1.8598	8 5 28.2	10.875	5	11 18 16.05	1.8170	0 57 14.0	11.476
6	9 52 19.25	1.8579	7 54 34.8	10.904	6	11 20 5.08	1.8172	1 8 42.4	11.472
7	9 54 10.67	1.8560	7 43 39.7	10.932	7	11 21 54.12	1.8176	1 20 10.6	11.467
8	9 56 1.97	1.8541	7 32 43.0	10.958	8	11 23 43.19	1.8180	1 31 38.5	11.462
9	9 57 53.16	1.8522	7 21 44.7	10.985	9	11 25 32.28	1.8184	1 43 6.1	11.457
10	9 59 44.24	1.8504	7 10 44.8	11.012	10	11 27 21.40	1.8189	1 54 33.3	11.450
11	10 1 35.21	1.8487	6 59 43.3	11.037	11	11 29 10.55	1.8194	2 6 0.1	11.442
12	10 3 26.08	1.8469	6 48 40.3	11.062	12	11 30 59.73	1.8200	2 17 26.4	11.434
13	10 5 16.84	1.8452	6 37 35.9	11.085	13	11 32 48.95	1.8207	2 28 52.2	11.426
14	10 7 7.51	1.8437	6 26 30.1	11.108	14	11 34 38.22	1.8215	2 40 17.5	11.417
15	10 8 58.08	1.8420	6 15 22.9	11.131	15	11 36 27.53	1.8222	2 51 42.3	11.407
16	10 10 48.55	1.8404	6 4 14.4	11.152	16	11 38 16.88	1.8230	3 3 6.4	11.397
17	10 12 38.93	1.8390	5 53 4.6	11.173	17	11 40 6.29	1.8239	3 14 29.9	11.386
18	10 14 29.23	1.8376	5 41 53.6	11.193	18	11 41 55.75	1.8247	3 25 52.7	11.373
19	10 16 19.44	1.8362	5 30 41.4	11.213	19	11 43 45.26	1.8257	3 37 14.7	11.361
20	10 18 9.57	1.8348	5 19 28.0	11.232	20	11 45 34.83	1.8267	3 48 36.0	11.348
21	10 19 59.62	1.8335	5 8 13.5	11.250	21	11 47 24.47	1.8278	3 59 56.5	11.334
22	10 21 49.59	1.8322	4 56 58.0	11.267	22	11 49 14.17	1.8289	4 11 16.1	11.320
23	10 23 39.49	1.8311	4 45 41.4	11.285	23	11 51 3.94	1.8300	4 22 34.9	11.305
24	10 25 29.32	1.8299	N. 4 34 23.8	11.301	24	11 52 53.77	1.8312	S. 4 33 52.7	11.288

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 17.					MONDAY 19.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 52 53.77	1.8312	S. 4 33 52.7	11.288	0	13 23 8.83	1.9480	S. 13 4 38.5	9.723
1	11 54 43.68	1.8325	4 45 9.5	11.272	1	13 25 5.82	1.9516	13 14 20.4	9.672
2	11 56 33.67	1.8338	4 56 25.3	11.255	2	13 27 3.02	1.9552	13 23 59.2	9.622
3	11 58 23.74	1.8352	5 7 40.1	11.237	3	13 29 0.45	1.9590	13 33 35.0	9.570
4	12 0 13.89	1.8366	5 18 53.8	11.219	4	13 30 58.10	1.9627	13 43 7.6	9.517
5	12 2 4.13	1.8381	5 30 6.4	11.200	5	13 32 55.97	1.9664	13 52 37.0	9.463
6	12 3 54.46	1.8396	5 41 17.8	11.180	6	13 34 54.07	1.9702	14 2 3.2	9.409
7	12 5 44.88	1.8412	5 52 28.0	11.159	7	13 36 52.39	1.9740	14 11 26.1	9.353
8	12 7 35.40	1.8428	6 3 36.9	11.138	8	13 38 50.95	1.9779	14 20 45.6	9.298
9	12 9 26.02	1.8445	6 14 44.6	11.117	9	13 40 49.74	1.9818	14 30 1.8	9.242
10	12 11 16.74	1.8462	6 25 50.9	11.094	10	13 42 48.77	1.9858	14 39 14.6	9.184
11	12 13 7.56	1.8479	6 36 55.9	11.072	11	13 44 48.04	1.9899	14 48 23.9	9.126
12	12 14 58.49	1.8497	6 47 59.5	11.047	12	13 46 47.56	1.9940	14 57 29.7	9.067
13	12 16 49.53	1.8516	6 59 1.6	11.023	13	13 48 47.32	1.9980	15 6 31.9	9.007
14	12 18 40.68	1.8535	7 10 2.3	10.998	14	13 50 47.32	2.0021	15 15 30.5	8.947
15	12 20 31.95	1.8555	7 21 1.4	10.972	15	13 52 47.57	2.0062	15 24 25.5	8.885
16	12 22 23.34	1.8576	7 31 58.9	10.945	16	13 54 48.07	2.0105	15 33 16.7	8.822
17	12 24 14.86	1.8597	7 42 54.8	10.918	17	13 56 48.83	2.0147	15 42 4.2	8.760
18	12 26 6.50	1.8617	7 53 49.1	10.891	18	13 58 49.84	2.0189	15 50 47.9	8.696
19	12 27 58.27	1.8639	8 4 41.7	10.862	19	14 0 51.10	2.0232	15 59 27.7	8.631
20	12 29 50.17	1.8661	8 15 32.5	10.832	20	14 2 52.63	2.0276	16 8 3.6	8.565
21	12 31 42.20	1.8683	8 26 21.5	10.802	21	14 4 54.41	2.0319	16 16 35.5	8.498
22	12 33 34.37	1.8707	8 37 8.7	10.772	22	14 6 56.46	2.0363	16 25 3.4	8.432
23	12 35 26.69	1.8732	S. 8 47 54.1	10.740	23	14 8 58.77	2.0407	S. 16 33 27.3	8.363
SUNDAY 18.					TUESDAY 20.				
0	12 37 19.15	1.8756	S. 8 58 37.5	10.707	0	14 11 1.35	2.0452	S. 16 41 47.0	8.294
1	12 39 11.76	1.8780	9 9 19.0	10.675	1	14 13 4.20	2.0497	16 50 2.6	8.224
2	12 41 4.51	1.8805	9 19 58.5	10.642	2	14 15 7.31	2.0542	16 58 13.9	8.153
3	12 42 57.42	1.8831	9 30 36.0	10.607	3	14 17 10.70	2.0588	17 6 21.0	8.082
4	12 44 50.48	1.8857	9 41 11.4	10.573	4	14 19 14.37	2.0634	17 14 23.8	8.010
5	12 46 43.70	1.8883	9 51 44.7	10.538	5	14 21 18.31	2.0679	17 22 22.2	7.937
6	12 48 37.08	1.8911	10 2 15.9	10.502	6	14 23 22.52	2.0726	17 30 16.2	7.862
7	12 50 30.63	1.8938	10 12 44.9	10.464	7	14 25 27.02	2.0773	17 38 5.7	7.788
8	12 52 24.34	1.8967	10 23 11.6	10.426	8	14 27 31.80	2.0820	17 45 50.7	7.712
9	12 54 18.23	1.8996	10 33 36.0	10.387	9	14 29 36.86	2.0867	17 53 31.1	7.635
10	12 56 12.29	1.9024	10 43 58.1	10.348	10	14 31 42.20	2.0914	18 1 6.9	7.557
11	12 58 6.52	1.9053	10 54 17.8	10.308	11	14 33 47.83	2.0962	18 8 38.0	7.478
12	13 0 0.93	1.9083	11 4 35.1	10.267	12	14 35 53.74	2.1009	18 16 4.3	7.399
13	13 1 55.52	1.9114	11 14 49.9	10.227	13	14 37 59.94	2.1057	18 23 25.9	7.319
14	13 3 50.30	1.9146	11 25 2.3	10.185	14	14 40 6.43	2.1105	18 30 42.6	7.237
15	13 5 45.27	1.9177	11 35 12.1	10.142	15	14 42 13.20	2.1153	18 37 54.4	7.156
16	13 7 40.42	1.9208	11 45 19.3	10.098	16	14 44 20.27	2.1202	18 45 1.4	7.073
17	13 9 35.77	1.9242	11 55 24.0	10.054	17	14 46 27.63	2.1251	18 52 3.3	6.989
18	13 11 31.32	1.9274	12 5 25.9	10.009	18	14 48 35.28	2.1300	18 59 0.1	6.904
19	13 13 27.06	1.9307	12 15 25.1	9.963	19	14 50 43.23	2.1349	19 5 51.8	6.819
20	13 15 23.00	1.9341	12 25 21.5	9.917	20	14 52 51.47	2.1398	19 12 38.4	6.732
21	13 17 19.15	1.9375	12 35 15.1	9.869	21	14 55 0.01	2.1447	19 19 19.7	6.645
22	13 19 15.50	1.9409	12 45 5.8	9.821	22	14 57 8.84	2.1497	19 25 55.8	6.557
23	13 21 12.06	1.9444	12 54 53.6	9.772	23	14 59 17.97	2.1546	19 32 26.5	6.467
24	13 23 8.83	1.9480	S. 13 4 38.5	9.723	24	15 1 27.39	2.1595	S. 19 38 51.9	6.377

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 21.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	h	m	s	s	°	′	″	″
0	15	1	27.39	2.1595	S.19	38	51.9	6.377
1	15	3	37.11	2.1645	19	45	11.8	6.287
2	15	5	47.13	2.1695	19	51	26.3	6.195
3	15	7	57.45	2.1745	19	57	35.2	6.102
4	15	10	8.07	2.1794	20	3	38.5	6.007
5	15	12	18.98	2.1844	20	9	36.1	5.912
6	15	14	30.20	2.1894	20	15	28.0	5.817
7	15	16	41.71	2.1943	20	21	14.2	5.722
8	15	18	53.52	2.1993	20	26	54.6	5.624
9	15	21	5.63	2.2043	20	32	29.1	5.526
10	15	23	18.04	2.2093	20	37	57.7	5.427
11	15	25	30.75	2.2142	20	43	20.3	5.326
12	15	27	43.75	2.2192	20	48	36.8	5.225
13	15	29	57.05	2.2242	20	53	47.3	5.123
14	15	32	10.65	2.2292	20	58	51.6	5.020
15	15	34	24.55	2.2341	21	3	49.7	4.917
16	15	36	38.74	2.2390	21	8	41.6	4.812
17	15	38	53.23	2.2439	21	13	27.2	4.707
18	15	41	8.01	2.2487	21	18	6.4	4.600
19	15	43	23.08	2.2537	21	22	39.2	4.492
20	15	45	38.45	2.2586	21	27	5.5	4.384
21	15	47	54.11	2.2634	21	31	25.3	4.276
22	15	50	10.06	2.2682	21	35	38.6	4.166
23	15	52	26.30	2.2731	S.21	39	45.2	4.055

THURSDAY 22.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	h	m	s	s	°	′	″	″
0	15	54	42.83	2.2779	S.21	43	45.2	3.943
1	15	56	59.65	2.2827	21	47	38.4	3.831
2	15	59	16.75	2.2873	21	51	24.9	3.717
3	16	1	34.13	2.2920	21	55	4.5	3.602
4	16	3	51.79	2.2967	21	58	37.2	3.488
5	16	6	9.74	2.3014	22	2	3.1	3.372
6	16	8	27.96	2.3060	22	5	21.9	3.254
7	16	10	46.46	2.3106	22	8	33.6	3.137
8	16	13	5.23	2.3151	22	11	38.3	3.018
9	16	15	24.27	2.3197	22	14	35.8	2.899
10	16	17	43.59	2.3242	22	17	26.2	2.779
11	16	20	3.17	2.3286	22	20	9.3	2.658
12	16	22	23.02	2.3330	22	22	45.2	2.537
13	16	24	43.13	2.3373	22	25	13.7	2.414
14	16	27	3.50	2.3417	22	27	34.9	2.291
15	16	29	24.13	2.3460	22	29	48.6	2.167
16	16	31	45.02	2.3502	22	31	54.9	2.042
17	16	34	6.16	2.3544	22	33	53.6	1.916
18	16	36	27.55	2.3586	22	35	44.8	1.789
19	16	38	49.19	2.3627	22	37	28.3	1.662
20	16	41	11.07	2.3667	22	39	4.2	1.534
21	16	43	33.19	2.3707	22	40	32.4	1.406
22	16	45	55.55	2.3746	22	41	52.9	1.277
23	16	48	18.14	2.3785	22	43	5.6	1.147
24	16	50	40.97	2.3823	S.22	44	10.5	1.016

FRIDAY 23.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	h	m	s	s	°	′	″	″
0	16	50	40.97	2.3823	S.22	44	10.5	1.016
1	16	53	4.02	2.3861	22	45	7.5	0.885
2	16	55	27.30	2.3898	22	45	56.7	0.753
3	16	57	50.80	2.3935	22	46	37.9	0.620
4	17	0	14.52	2.3971	22	47	11.1	0.487
5	17	2	38.45	2.4006	22	47	36.3	0.353
6	17	5	2.59	2.4041	22	47	53.5	0.219
7	17	7	26.94	2.4075	22	48	2.6	− 0.084
8	17	9	51.49	2.4108	22	48	3.6	+ 0.052
9	17	12	16.24	2.4141	22	47	56.4	0.188
10	17	14	41.18	2.4173	22	47	41.0	0.325
11	17	17	6.32	2.4205	22	47	17.4	0.462
12	17	19	31.64	2.4236	22	46	45.6	0.599
13	17	21	57.15	2.4266	22	46	5.5	0.737
14	17	24	22.83	2.4295	22	45	17.1	0.876
15	17	26	48.69	2.4323	22	44	20.4	1.015
16	17	29	14.71	2.4351	22	43	15.3	1.154
17	17	31	40.90	2.4379	22	42	1.9	1.294
18	17	34	7.26	2.4406	22	40	40.0	1.435
19	17	36	33.77	2.4431	22	39	9.7	1.576
20	17	39	0.43	2.4456	22	37	30.9	1.717
21	17	41	27.24	2.4481	22	35	43.6	1.858
22	17	43	54.20	2.4504	22	33	47.9	2.000
23	17	46	21.29	2.4527	S.22	31	43.6	2.142

SATURDAY 24.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
	h	m	s	s	°	′	″	″
0	17	48	48.52	2.4549	S.22	29	30.8	2.284
1	17	51	15.88	2.4570	22	27	9.5	2.427
2	17	53	43.36	2.4591	22	24	39.6	2.570
3	17	56	10.97	2.4611	22	22	1.1	2.713
4	17	58	38.69	2.4629	22	19	14.0	2.857
5	18	1	6.52	2.4648	22	16	18.3	3.000
6	18	3	34.46	2.4666	22	13	14.0	3.143
7	18	6	2.51	2.4682	22	10	1.1	3.287
8	18	8	30.65	2.4697	22	6	39.5	3.432
9	18	10	58.88	2.4712	22	3	9.3	3.575
10	18	13	27.20	2.4727	21	59	30.5	3.719
11	18	15	55.60	2.4740	21	55	43.0	3.863
12	18	18	24.08	2.4753	21	51	46.9	4.007
13	18	20	52.64	2.4765	21	47	42.1	4.152
14	18	23	21.26	2.4776	21	43	28.7	4.296
15	18	25	49.95	2.4787	21	39	6.6	4.440
16	18	28	18.70	2.4797	21	34	35.9	4.584
17	18	30	47.51	2.4806	21	29	56.5	4.728
18	18	33	16.37	2.4813	21	25	8.5	4.872
19	18	35	45.27	2.4821	21	20	11.9	5.016
20	18	38	14.22	2.4827	21	15	6.6	5.159
21	18	40	43.20	2.4832	21	9	52.8	5.302
22	18	43	12.21	2.4838	21	4	30.4	5.445
23	18	45	41.26	2.4843	20	58	59.4	5.587
24	18	48	10.33	2.4847	S.20	53	19.9	5.730

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 25.					TUESDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 48 10.33	2.4847	S.20 53 19.9	5.730	0	20 46 42.21	2.4367	S.13 45 11.5	11.770
1	18 50 39.42	2.4849	20 47 31.8	5.872	1	20 49 8.36	2.4349	13 33 22.3	11.869
2	18 53 8.52	2.4852	20 41 35.2	6.014	2	20 51 34.40	2.4331	13 21 27.2	11.967
3	18 55 37.64	2.4853	20 35 30.1	6.156	3	20 54 0.33	2.4312	13 9 26.2	12.064
4	18 58 6.76	2.4854	20 29 16.5	6.297	4	20 56 26.15	2.4293	12 57 19.5	12.159
5	19 0 35.89	2.4854	20 22 54.5	6.437	5	20 58 51.85	2.4275	12 45 7.1	12.253
6	19 3 5.01	2.4853	20 16 24.0	6.578	6	21 1 17.45	2.4257	12 32 49.1	12.345
7	19 5 34.13	2.4852	20 9 45.1	6.718	7	21 3 42.93	2.4237	12 20 25.7	12.436
8	19 8 3.24	2.4851	20 2 57.8	6.857	8	21 6 8.30	2.4219	12 7 56.8	12.526
9	19 10 32.34	2.4848	19 56 2.2	6.997	9	21 8 33.56	2.4201	11 55 22.6	12.613
10	19 13 1.42	2.4845	19 48 58.2	7.135	10	21 10 58.71	2.4182	11 42 43.2	12.699
11	19 15 30.48	2.4841	19 41 46.0	7.272	11	21 13 23.75	2.4164	11 29 58.7	12.783
12	19 17 59.51	2.4836	19 34 25.5	7.410	12	21 15 48.68	2.4146	11 17 9.2	12.866
13	19 20 28.51	2.4831	19 26 56.8	7.547	13	21 18 13.50	2.4127	11 4 14.7	12.947
14	19 22 57.48	2.4826	19 19 19.9	7.683	14	21 20 38.20	2.4108	10 51 15.4	13.027
15	19 25 26.42	2.4819	19 11 34.8	7.819	15	21 23 2.80	2.4091	10 38 11.4	13.106
16	19 27 55.31	2.4812	19 3 41.6	7.953	16	21 25 27.29	2.4072	10 25 2.7	13.182
17	19 30 24.16	2.4805	18 55 40.4	8.087	17	21 27 51.67	2.4054	10 11 49.5	13.257
18	19 32 52.97	2.4798	18 47 31.1	8.221	18	21 30 15.94	2.4036	9 58 31.9	13.330
19	19 35 21.73	2.4788	18 39 13.9	8.353	19	21 32 40.10	2.4018	9 45 9.9	13.402
20	19 37 50.43	2.4778	18 30 48.7	8.485	20	21 35 4.16	2.4001	9 31 43.7	13.471
21	19 40 19.07	2.4769	18 22 15.7	8.616	21	21 37 28.11	2.3983	9 18 13.4	13.539
22	19 42 47.66	2.4760	18 13 34.8	8.747	22	21 39 51.96	2.3966	9 4 39.0	13.606
23	19 45 16.19	2.4749	S.18 4 46.1	8.876	23	21 42 15.70	2.3948	S. 8 51 0.7	13.670
	MONDAY 26.					WEDNESDAY 28.			
0	19 47 44.65	2.4738	S.17 55 49.7	9.004	0	21 44 39.34	2.3932	S. 8 37 18.6	13.732
1	19 50 13.05	2.4727	17 46 45.6	9.132	1	21 47 2.88	2.3914	8 23 32.8	13.794
2	19 52 41.37	2.4714	17 37 33.8	9.259	2	21 49 26.31	2.3897	8 9 43.3	13.853
3	19 55 9.62	2.4702	17 28 14.5	9.384	3	21 51 49.65	2.3882	7 55 50.4	13.911
4	19 57 37.79	2.4689	17 18 47.6	9.509	4	21 54 12.89	2.3865	7 41 54.0	13.967
5	20 0 5.89	2.4677	17 9 13.3	9.633	5	21 56 36.03	2.3849	7 27 54.4	14.021
6	20 2 33.91	2.4663	16 59 31.6	9.757	6	21 58 59.08	2.3833	7 13 51.5	14.073
7	20 5 1.84	2.4648	16 49 42.5	9.878	7	22 1 22.03	2.3817	6 59 45.6	14.123
8	20 7 29.69	2.4634	16 39 46.2	9.998	8	22 3 44.89	2.3802	6 45 36.7	14.172
9	20 9 57.45	2.4619	16 29 42.7	10.118	9	22 6 7.66	2.3787	6 31 25.0	14.218
10	20 12 25.12	2.4604	16 19 32.0	10.237	10	22 8 30.34	2.3772	6 17 10.5	14.263
11	20 14 52.70	2.4588	16 9 14.2	10.355	11	22 10 52.93	2.3757	6 2 53.4	14.307
12	20 17 20.18	2.4572	15 58 49.4	10.471	12	22 13 15.43	2.3743	5 48 33.7	14.348
13	20 19 47.57	2.4558	15 48 17.7	10.586	13	22 15 37.85	2.3730	5 34 11.6	14.387
14	20 22 14.87	2.4542	15 37 39.1	10.700	14	22 18 0.19	2.3717	5 19 47.2	14.425
15	20 24 42.07	2.4524	15 26 53.7	10.812	15	22 20 22.45	2.3703	5 5 20.6	14.461
16	20 27 9.16	2.4507	15 16 1.6	10.924	16	22 22 44.63	2.3691	4 50 51.9	14.494
17	20 29 36.16	2.4491	15 5 2.8	11.034	17	22 25 6.74	2.3678	4 36 21.3	14.527
18	20 32 3.05	2.4473	14 53 57.5	11.143	18	22 27 28.77	2.3665	4 21 48.7	14.557
19	20 34 29.84	2.4457	14 42 45.6	11.252	19	22 29 50.72	2.3653	4 7 14.4	14.585
20	20 36 56.53	2.4439	14 31 27.3	11.358	20	22 32 12.61	2.3642	3 52 38.5	14.611
21	20 39 23.11	2.4422	14 20 2.7	11.463	21	22 34 34.43	2.3631	3 38 1.1	14.636
22	20 41 49.59	2.4403	14 8 31.8	11.567	22	22 36 56.18	2.3619	3 23 22.2	14.659
23	20 44 15.95	2.4385	13 56 54.7	11.669	23	22 39 17.86	2.3608	3 8 42.0	14.680
24	20 46 42.21	2.4367	S.13 45 11.5	11.770	24	22 41 39.48	2.3598	S. 2 54 0.6	14.699

GREENWICH MEAN TIME.

PHASES OF THE MOON.

		d	h	m
☽ First Quarter	Feb.	6	4	23.1
○ Full Moon		14	1	50.3
☾ Last Quarter		22	4	44.2
● New Moon		28	23	25.2

		h	m
☾ Apogee	Feb.	15	13.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	SUN	W.	21 0 7	2382	22 44 8	2375	24 28 19	2371	26 12 35	2371
	α Arietis	E.	63 11 27	2037	61 18 50	2043	59 26 21	2049	57 34 4	2055
	Aldebaran	E.	96 9 24	2028	94 16 34	2033	92 23 51	2037	90 31 15	2042
	Pollux	E.	137 38 47	2129	135 48 32	2124	133 58 10	2122	132 7 45	2121
2	SUN	W.	34 53 22	2390	36 37 11	2398	38 20 49	2408	40 4 13	2416
	α Arietis	E.	48 15 46	2105	46 24 55	2118	44 34 24	2132	42 44 13	2147
	Aldebaran	E.	81 10 43	2081	79 19 15	2090	77 28 0	2101	75 37 2	2112
	Pollux	E.	122 55 58	2136	121 5 54	2142	119 15 59	2149	117 26 15	2157
3	SUN	W.	48 37 38	2474	50 19 28	2487	52 1 0	2501	53 42 12	2515
	Aldebaran	E.	66 26 39	2174	64 37 33	2189	62 48 49	2204	61 0 27	2218
	Pollux	E.	108 20 56	2208	106 32 40	2220	104 44 42	2232	102 57 2	2245
4	SUN	W.	62 3 7	2591	63 42 14	2608	65 20 58	2624	66 59 20	2640
	α Pegasi	W.	28 41 14	2888	30 13 48	2842	31 47 22	2804	33 21 45	2772
	VENUS	W.	28 48 16	2757	30 23 40	2765	31 58 54	2772	33 33 58	2782
	Aldebaran	E.	52 4 24	2301	50 18 26	2318	48 32 53	2336	46 47 46	2355
	Pollux	E.	94 3 43	2316	92 18 7	2331	90 32 53	2347	88 48 2	2363
	Regulus	E.	131 1 49	2288	129 15 32	2302	127 29 35	2315	125 43 58	2330
5	SUN	W.	75 5 35	2725	76 41 41	2742	78 17 25	2760	79 52 46	2776
	α Pegasi	W.	41 21 19	2698	42 58 1	2695	44 34 47	2694	46 11 35	2693
	VENUS	W.	41 25 44	2844	42 59 15	2857	44 32 29	2872	46 5 24	2887
	Aldebaran	E.	38 9 9	2456	36 26 54	2478	34 45 10	2501	33 3 58	2525
	Pollux	E.	80 9 29	2443	78 26 56	2460	76 44 47	2477	75 3 2	2494
	Regulus	E.	117 1 13	2405	115 17 45	2421	113 34 40	2436	111 51 56	2450
6	SUN	W.	87 43 59	2861	89 17 8	2878	90 49 55	2894	92 22 21	2910
	α Pegasi	W.	54 14 56	2716	55 51 15	2722	57 27 25	2730	59 3 25	2739
	VENUS	W.	53 45 14	2962	55 16 14	2977	56 46 56	2992	58 17 19	3008
	Pollux	E.	66 40 13	2580	65 0 50	2597	63 21 51	2615	61 43 16	2632
	Regulus	E.	103 23 39	2527	101 43 4	2543	100 2 50	2557	98 22 56	2572
7	SUN	W.	99 59 30	2989	101 29 56	3004	103 0 4	3020	104 29 52	3034
	VENUS	W.	65 44 29	3082	67 13 1	3096	68 41 15	3110	70 9 12	3125
	α Arietis	W.	23 22 27	2796	24 57 0	2792	26 31 38	2790	28 6 19	2790
	Pollux	E.	53 36 14	2720	52 0 1	2738	50 24 12	2757	48 48 48	2775
	Regulus	E.	90 8 29	2644	88 30 34	2658	86 52 58	2672	85 15 40	2685
8	SUN	W.	111 54 29	3105	113 22 33	3117	114 50 22	3131	116 17 54	3143
	VENUS	W.	77 24 44	3192	78 51 3	3205	80 17 6	3217	81 42 55	3230
	α Arietis	W.	35 59 7	2809	37 33 23	2816	39 7 30	2822	40 41 29	2830
	Pollux	E.	40 58 2	2876	39 25 12	2898	37 52 50	2920	36 20 57	2946
	Regulus	E.	77 13 34	2749	75 37 59	2762	74 2 41	2773	72 27 38	2785
	Spica	E.	131 13 46	2735	129 37 53	2747	128 2 16	2759	126 26 54	2769
9	SUN	W.	123 31 49	3204	124 57 53	3215	126 23 44	3227	127 49 21	3239
	VENUS	W.	88 48 28	3287	90 12 55	3298	91 37 9	3308	93 1 11	3319
	α Arietis	W.	48 28 58	2867	50 1 59	2876	51 34 49	2883	53 7 29	2890
	Regulus	E.	64 36 9	2841	63 2 34	2852	61 29 13	2862	59 56 5	2871
	Spica	E.	118 33 35	2822	116 59 36	2831	115 25 49	2842	113 52 15	2851

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	SUN	W.	27 56 52	2372	29 41 7	2374	31 25 19	2379	33 9 24	2384
	α Arietis	E.	55 41 57	2064	53 50 2	2073	51 58 21	2083	50 6 55	2094
	Aldebaran	E.	88 38 47	2049	86 46 29	2055	84 54 21	2063	83 2 25	2072
	Pollux	E.	130 17 18	2121	128 26 51	2124	126 36 29	2127	124 46 11	2130
2	SUN	W.	41 47 25	2426	43 30 22	2437	45 13 4	2448	46 55 30	2461
	α Arietis	E.	40 54 25	2163	39 5 1	2180	37 16 3	2198	35 27 32	2218
	Aldebaran	E.	73 46 21	2124	71 55 58	2136	70 5 53	2148	68 16 6	2161
	Pollux	E.	115 36 43	2166	113 47 24	2175	111 58 19	2185	110 9 29	2196
3	SUN	W.	55 23 5	2530	57 3 37	2545	58 43 48	2560	60 23 38	2575
	Aldebaran	E.	59 12 27	2234	57 24 50	2250	55 37 37	2266	53 50 48	2283
	Pollux	E.	101 9 41	2258	99 22 40	2272	97 36 0	2287	95 49 41	2301
4	SUN	W.	68 37 21	2657	70 14 58	2674	71 52 13	2691	73 29 5	2707
	α Pegasi	W.	34 56 50	2747	36 32 27	2729	38 8 28	2716	39 44 47	2706
	VENUS	W.	35 8 49	2792	36 43 27	2805	38 17 49	2817	39 51 55	2830
	Aldebaran	E.	45 3 6	2374	43 18 54	2394	41 35 10	2414	39 51 55	2434
	Pollux	E.	87 3 33	2379	85 19 28	2394	83 35 45	2410	81 52 25	2427
	Regulus	E.	123 58 42	2344	122 13 47	2359	120 29 14	2375	118 45 3	2389
5	SUN	W.	81 27 45	2794	83 2 21	2810	84 36 36	2828	86 10 28	2844
	α Pegasi	W.	47 48 24	2695	49 25 10	2698	51 1 52	2703	52 38 28	2709
	VENUS	W.	47 38 0	2901	49 10 17	2916	50 42 15	2931	52 13 54	2946
	Aldebaran	E.	31 23 20	2551	29 43 17	2578	28 3 52	2607	26 25 7	2638
	Pollux	E.	73 21 41	2512	71 40 44	2528	70 0 10	2545	68 20 0	2562
	Regulus	E.	110 9 33	2466	108 27 32	2482	106 45 53	2497	105 4 35	2512
6	SUN	W.	93 54 27	2926	95 26 13	2942	96 57 39	2958	98 28 44	2973
	α Pegasi	W.	60 39 13	2748	62 14 49	2757	63 50 13	2766	65 25 25	2776
	VENUS	W.	59 47 22	3023	61 17 6	3038	62 46 32	3053	64 15 39	3067
	Pollux	E.	60 5 4	2649	58 27 16	2667	56 49 52	2684	55 12 51	2702
	Regulus	E.	96 43 23	2587	95 4 10	2601	93 25 17	2615	91 46 43	2630
7	SUN	W.	105 59 23	3048	107 28 36	3063	108 57 31	3078	110 26 8	3091
	VENUS	W.	71 36 51	3138	73 4 14	3153	74 31 20	3166	75 58 10	3179
	α Arietis	W.	29 41 0	2791	31 15 40	2795	32 50 15	2799	34 24 44	2804
	Pollux	E.	47 13 48	2795	45 39 13	2815	44 5 4	2834	42 31 20	2854
	Regulus	E.	83 38 40	2698	82 1 58	2711	80 25 33	2724	78 49 25	2737
8	SUN	W.	117 45 11	3157	119 12 12	3168	120 38 59	3181	122 5 31	3193
	VENUS	W.	83 8 29	3242	84 33 49	3253	85 58 55	3265	87 23 48	3276
	α Arietis	W.	42 15 18	2838	43 48 57	2845	45 22 27	2852	46 55 47	2859
	Pollux	E.	34 49 36	2972	33 18 48	3000	31 48 35	3030	30 18 59	3063
	Regulus	E.	70 52 51	2797	69 18 19	2808	67 44 1	2819	66 9 58	2830
	Spica	E.	124 51 46	2781	123 16 53	2791	121 42 13	2801	120 7 47	2812
9	SUN	W.	129 14 44	3250	130 39 54	3260	132 4 52	3270	133 29 38	3281
	VENUS	W.	94 25 1	3329	95 48 39	3338	97 12 6	3348	98 35 22	3357
	α Arietis	W.	54 40 1	2897	56 12 24	2905	57 44 36	2913	59 16 38	2920
	Regulus	E.	58 23 9	2881	56 50 26	2892	55 17 57	2901	53 45 39	2910
	Spica	E.	112 18 53	2860	110 45 43	2868	109 12 43	2876	107 39 54	2886

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III$^{\text{h}}$.	P. L. of Diff.	VI$^{\text{h}}$.	P. L. of Diff.	IX$^{\text{h}}$.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	**Venus**	W.	99 58 28	3366	101 21 23	3375	102 44 8	3384	104 6 43	3393
	a Arietis	W.	60 48 32	2927	62 20 17	2934	63 51 53	2941	65 23 20	2947
	Aldebaran	W.	28 4 30	3006	29 34 35	3005	31 4 42	3004	32 34 50	3003
	Regulus	E.	52 13 33	2920	50 41 39	2929	49 9 57	2939	47 38 27	2948
	Spica	E.	106 7 17	2894	104 34 50	2901	103 2 33	2909	101 30 26	2916
11	**Venus**	W.	110 57 18	3431	112 18 59	3439	113 40 31	3446	115 1 56	3453
	a Arietis	W.	72 58 33	2979	74 29 12	2985	75 59 44	2991	77 30 8	2996
	Aldebaran	W.	40 5 23	3010	41 35 23	3013	43 5 19	3016	44 35 12	3019
	Regulus	E.	40 3 50	2993	38 33 29	3002	37 3 19	3012	35 33 21	3022
	Spica	E.	93 52 8	2951	92 20 54	2958	90 49 48	2963	89 18 49	2969
	Jupiter	E.	139 26 50	2997	137 56 34	3003	136 26 25	3009	134 56 23	3015
12	Aldebaran	W.	52 3 38	3035	53 33 7	3039	55 2 32	3042	56 31 53	3044
	Spica	E.	81 45 43	2997	80 15 26	3001	78 45 15	3006	77 15 10	3010
	Antares	E.	127 13 20	3007	125 43 16	3012	124 13 18	3016	122 43 25	3020
	Jupiter	E.	127 27 58	3041	125 58 36	3045	124 29 19	3050	123 0 8	3055
13	Aldebaran	W.	63 57 41	3060	65 26 39	3063	66 55 34	3066	68 24 25	3069
	Pollux	W.	23 21 12	3414	24 43 13	3375	26 5 58	3346	27 29 16	3319
	Spica	E.	69 46 6	3031	68 16 32	3035	66 47 3	3039	65 17 38	3043
	Antares	E.	115 15 14	3039	113 45 50	3043	112 16 30	3046	110 47 14	3049
	Jupiter	E.	115 35 32	3074	114 6 51	3078	112 38 15	3081	111 9 42	3084
14	Aldebaran	W.	75 47 53	3081	77 16 26	3083	78 44 56	3085	80 13 24	3087
	Pollux	W.	34 32 3	3237	35 57 28	3227	37 23 5	3219	38 48 52	3210
	Spica	E.	57 51 36	3057	56 22 34	3060	54 53 36	3063	53 24 41	3065
	Antares	E.	103 21 49	3063	101 52 54	3066	100 24 3	3068	98 55 14	3069
	Jupiter	E.	103 47 54	3099	102 19 43	3101	100 51 34	3103	99 23 28	3105
	Saturn	E.	127 45 31	3085	126 17 3	3087	124 48 38	3089	123 20 16	3091
15	Aldebaran	W.	87 35 10	3095	89 3 26	3096	90 31 40	3097	91 59 53	3098
	Pollux	W.	45 59 48	3183	47 26 17	3179	48 52 51	3175	50 19 30	3172
	Spica	E.	46 0 43	3074	44 32 2	3077	43 3 24	3078	41 34 47	3079
	Antares	E.	91 31 43	3078	90 3 7	3079	88 34 32	3080	87 5 58	3082
	Jupiter	E.	92 3 33	3114	90 35 40	3114	89 7 48	3115	87 39 57	3115
	Saturn	E.	115 58 59	3100	114 30 49	3101	113 2 41	3102	111 34 34	3103
16	Aldebaran	W.	99 20 46	3101	100 48 55	3100	102 17 5	3100	103 45 15	3100
	Pollux	W.	57 33 42	3158	59 0 42	3154	60 27 46	3151	61 54 54	3148
	Regulus	W.	20 34 56	3212	22 0 51	3197	23 27 4	3183	24 53 33	3172
	Spica	E.	34 12 1	3083	32 43 31	3083	31 15 1	3083	29 46 31	3084
	Antares	E.	79 43 24	3083	78 14 54	3083	76 46 24	3082	75 17 53	3082
	Jupiter	E.	80 20 49	3117	78 53 0	3117	77 25 11	3115	75 57 20	3115
	Saturn	E.	104 14 10	3105	102 46 6	3104	101 18 1	3103	99 49 55	3101
	a Aquilæ	E.	128 39 25	3866	127 25 31	3836	126 11 6	3807	124 56 11	3779
17	Pollux	W.	69 11 25	3133	70 38 54	3130	72 6 27	3127	73 34 4	3123
	Regulus	W.	32 9 11	3127	33 36 48	3120	35 4 33	3114	36 32 26	3107
	Jupiter	E.	68 37 49	3107	67 9 48	3105	65 41 45	3103	64 13 39	3100
	Saturn	E.	92 29 9	3096	91 0 54	3093	89 32 36	3090	88 4 15	3087
	a Aquilæ	E.	118 35 7	3669	117 17 47	3651	116 0 8	3634	114 42 10	3618

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	VENUS	W.	105 29 8	3400	106 51 24	3408	108 13 31	3416	109 35 29	3424
	α Arietis	W.	66 54 39	2954	68 25 49	2960	69 56 52	2967	71 27 46	2973
	Aldebaran	W.	34 4 59	3004	35 35 7	3005	37 5 15	3006	38 35 20	3008
	Regulus	E.	46 7 9	2957	44 36 2	2966	43 5 7	2975	41 34 23	2984
	Spica	E.	99 58 28	2924	98 26 40	2931	96 55 1	2938	95 23 30	2945
11	VENUS	W.	116 23 13	3460	117 44 22	3466	119 5 24	3472	120 26 19	3480
	α Arietis	W.	79 0 26	3002	80 30 36	3006	82 0 41	3012	83 30 39	3017
	Aldebaran	W.	46 5 1	3022	47 34 47	3026	49 4 28	3029	50 34 5	3032
	Regulus	E.	34 3 36	3033	32 34 4	3043	31 4 45	3055	29 35 40	3066
	Spica	E.	87 47 58	2975	86 17 14	2981	84 46 37	2986	83 16 7	2991
	JUPITER	E.	133 26 29	3021	131 56 42	3026	130 27 1	3030	128 57 26	3036
12	Aldebaran	W.	58 1 11	3048	59 30 24	3052	60 59 33	3054	62 28 39	3057
	Spica	E.	75 45 10	3015	74 15 16	3020	72 45 28	3024	71 15 45	3027
	Antares	E.	121 13 37	3024	119 43 54	3028	118 14 16	3032	116 44 43	3035
	JUPITER	E.	121 31 3	3059	120 2 3	3063	118 33 8	3067	117 4 18	3070
13	Aldebaran	W.	69 53 13	3071	71 21 58	3074	72 50 39	3077	74 19 17	3078
	Pollux	W.	28 53 5	3297	30 17 20	3278	31 41 57	3263	33 6 52	3249
	Spica	E.	63 48 18	3046	62 19 2	3049	60 49 50	3052	59 20 41	3055
	Antares	E.	109 18 2	3052	107 48 54	3055	106 19 49	3057	104 50 47	3060
	JUPITER	E.	109 41 13	3087	108 12 48	3090	106 44 27	3093	105 16 9	3096
14	Aldebaran	W.	81 41 49	3089	83 10 12	3091	84 38 33	3092	86 6 52	3093
	Pollux	W.	40 14 49	3204	41 40 54	3198	43 7 6	3193	44 33 24	3188
	Spica	E.	51 55 48	3067	50 26 58	3069	48 58 11	3071	47 29 26	3073
	Antares	E.	97 26 27	3072	95 57 43	3073	94 29 1	3075	93 0 21	3077
	JUPITER	E.	97 55 25	3107	96 27 24	3109	94 59 25	3110	93 31 28	3112
	SATURN	E.	121 51 56	3094	120 23 39	3096	118 55 24	3097	117 27 11	3098
15	Aldebaran	W.	93 28 5	3099	94 56 16	3100	96 24 26	3100	97 52 36	3100
	Pollux	W.	51 46 13	3168	53 13 0	3166	54 39 50	3163	56 6 44	3159
	Spica	E.	40 6 11	3080	38 37 37	3081	37 9 4	3082	35 40 32	3082
	Antares	E.	85 37 26	3082	84 8 55	3082	82 40 24	3083	81 11 54	3083
	JUPITER	E.	86 12 6	3116	84 44 16	3117	83 16 27	3117	81 48 38	3117
	SATURN	E.	110 6 28	3104	108 38 23	3105	107 10 19	3104	105 42 15	3104
16	Aldebaran	W.	105 13 25	3099	106 41 36	3099	108 9 47	3098	109 37 59	3096
	Pollux	W.	63 22 5	3145	64 49 20	3143	66 16 37	3140	67 43 59	3136
	Regulus	W.	26 20 16	3160	27 47 13	3149	29 14 23	3141	30 41 43	3134
	Spica	E.	28 18 2	3084	26 49 33	3085	25 21 5	3085	23 52 37	3085
	Antares	E.	73 49 22	3082	72 20 50	3080	70 52 16	3079	69 23 41	3078
	JUPITER	E.	74 29 29	3114	73 1 37	3113	71 33 43	3111	70 5 47	3110
	SATURN	E.	98 21 49	3101	96 53 41	3100	95 25 33	3099	93 57 21	3098
	α Aquilæ	E.	123 40 47	3754	122 24 57	3732	121 8 44	3710	119 52 7	3688
17	Pollux	W.	75 1 46	3119	76 29 33	3115	77 57 24	3110	79 25 21	3106
	Regulus	W.	38 0 27	3101	39 28 35	3096	40 56 50	3089	42 25 13	3083
	JUPITER	E.	62 45 29	3096	61 17 15	3093	59 48 58	3090	58 20 36	3087
	SATURN	E.	86 35 50	3085	85 7 22	3082	83 38 50	3078	82 10 13	3074
	α Aquilæ	E.	113 23 55	3602	112 5 23	3587	110 46 35	3573	109 27 31	3560

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
18	Pollux	W.	80 53 23	3101	82 21 31	3097	83 49 44	3092	85 18 3	3087
	Regulus	W.	43 53 43	3077	45 22 21	3071	46 51 6	3065	48 19 59	3058
	Antares	E.	56 4 33	3054	54 35 27	3051	53 6 17	3047	51 37 2	3042
	JUPITER	E.	56 52 10	3082	55 23 39	3078	53 55 2	3073	52 26 19	3067
	SATURN	E.	80 41 32	3070	79 12 46	3065	77 43 54	3060	76 14 56	3055
	α Aquilæ	E.	108 8 13	3547	106 48 41	3535	105 28 55	3523	104 8 56	3511
19	Pollux	W.	92 41 23	3056	94 10 26	3050	95 39 37	3043	97 8 57	3034
	Regulus	W.	55 46 31	3022	57 16 17	3014	58 46 12	3005	60 16 18	2997
	Antares	E.	44 9 16	3016	42 39 23	3010	41 9 23	3004	39 39 15	2997
	JUPITER	E.	45 1 1	3037	43 31 34	3030	42 1 59	3022	40 32 14	3014
	SATURN	E.	68 48 23	3025	67 18 41	3018	65 48 50	3009	64 18 49	3002
	α Aquilæ	E.	97 25 55	3458	96 4 44	3448	94 43 22	3439	93 21 50	3430
20	Regulus	W.	67 49 34	2950	69 20 50	2940	70 52 18	2929	72 24 0	2917
	JUPITER	E.	33 0 56	2971	31 30 7	2962	29 59 6	2951	28 27 52	2940
	SATURN	E.	56 46 11	2957	55 15 4	2947	53 43 45	2937	52 12 13	2925
	α Aquilæ	E.	86 31 36	3386	85 9 4	3379	83 46 23	3371	82 23 33	3364
	SUN	E.	115 10 20	3322	113 46 34	3311	112 22 35	3300	110 58 23	3287
21	Regulus	W.	80 6 13	2857	81 39 27	2844	83 12 58	2830	84 46 47	2817
	Spica	W.	26 3 9	2852	27 36 29	2838	29 10 8	2823	30 44 6	2808
	SATURN	E.	44 30 52	2866	42 57 49	2852	41 24 29	2838	39 50 51	2825
	α Aquilæ	E.	75 27 23	3331	74 3 47	3325	72 40 5	3320	71 16 17	3317
	SUN	E.	103 53 40	3221	102 27 57	3207	101 1 55	3193	99 35 37	3177
22	Spica	W.	38 38 49	2732	40 14 47	2715	41 51 7	2698	43 27 49	2682
	SATURN	E.	31 58 5	2750	30 22 32	2735	28 46 39	2719	27 10 24	2703
	α Aquilæ	E.	64 16 26	3308	62 52 24	3310	61 28 23	3312	60 4 25	3316
	SUN	E.	92 19 25	3096	90 51 11	3030	89 22 37	3063	87 53 42	3045
23	Spica	W.	51 36 58	2596	53 15 59	2577	54 55 25	2559	56 35 16	2541
	α Aquilæ	E.	53 6 33	3368	51 43 40	3387	50 21 9	3409	48 59 3	3436
	SUN	E.	80 23 30	2953	78 52 18	2934	77 20 42	2915	75 48 42	2895
24	Spica	W.	65 0 55	2448	66 43 21	2429	68 26 14	2410	70 9 34	2391
	JUPITER	W.	18 2 26	2487	19 43 57	2467	21 25 56	2447	23 8 24	2427
	SUN	E.	68 2 26	2798	66 27 55	2778	64 52 57	2758	63 17 34	2738
25	Spica	W.	78 52 56	2299	80 38 57	2281	82 25 25	2263	84 12 19	2245
	JUPITER	W.	31 47 51	2329	33 33 8	2310	35 18 53	2291	37 5 5	2273
	SUN	E.	55 14 9	2643	53 36 12	2624	51 57 49	2606	50 19 2	2588
26	Spica	W.	93 13 17	2161	95 2 43	2145	96 52 33	2130	98 42 46	2115
	Antares	W.	47 47 12	2175	49 36 17	2159	51 25 46	2143	53 15 40	2128
	JUPITER	W.	46 2 40	2187	47 51 27	2171	49 40 38	2155	51 30 13	2140
	SATURN	W.	22 21 56	2180	24 10 53	2165	26 0 14	2149	27 49 59	2134
	SUN	E.	41 59 14	2507	40 18 11	2493	38 36 48	2480	36 55 7	2468
27	JUPITER	W.	60 43 36	2073	62 35 17	2061	64 27 16	2050	66 19 32	2040
	SATURN	W.	37 4 8	2068	38 55 57	2055	40 48 5	2044	42 40 31	2035
	SUN	E.	28 22 58	2428	26 40 3	2426	24 57 6	2426	23 14 8	2429

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
18	Pollux	W.	86 46 29	3081	88 15 2	3076	89 43 41	3069	91 12 28	3063
	Regulus	W.	49 49 0	3051	51 18 10	3044	52 47 28	3037	54 16 55	3030
	Antares	E.	50 7 41	3038	48 38 15	3032	47 8 42	3026	45 39 2	3022
	JUPITER	E.	50 57 29	3062	49 28 33	3056	47 59 30	3050	46 30 19	3044
	SATURN	E.	74 45 51	3050	73 16 40	3044	71 47 22	3038	70 17 57	3031
	α Aquilæ	E.	102 48 44	3500	101 28 20	3489	100 7 43	3479	98 46 55	3468
19	Pollux	W.	98 38 27	3027	100 8 6	3020	101 37 54	3011	103 7 53	3003
	Regulus	W.	61 46 34	2989	63 17 1	2979	64 47 40	2969	66 18 31	2960
	Antares	E.	38 8 59	2992	36 38 36	2985	35 8 4	2977	33 37 23	2971
	JUPITER	E.	39 2 19	3007	37 32 15	2998	36 2 0	2989	34 31 34	2980
	SATURN	E.	62 48 39	2994	61 18 19	2985	59 47 48	2976	58 17 5	2967
	α Aquilæ	E.	92 0 7	3421	90 38 14	3412	89 16 11	3403	87 53 58	3395
20	Regulus	W.	73 55 57	2906	75 28 8	2894	77 0 34	2882	78 33 16	2870
	JUPITER	E.	26 56 24	2930	25 24 43	2920	23 52 49	2909	22 20 41	2898
	SATURN	E.	50 40 26	2914	49 8 25	2903	47 36 10	2891	46 3 39	2878
	α Aquilæ	E.	81 0 35	3356	79 37 28	3350	78 14 14	3343	76 50 52	3337
	SUN	E.	109 33 56	3275	108 9 15	3262	106 44 19	3249	105 19 8	3235
21	Regulus	W.	86 20 53	2802	87 55 18	2788	89 30 1	2773	91 5 4	2758
	Spica	W.	32 18 23	2793	33 53 0	2779	35 27 56	2763	37 3 12	2747
	SATURN	E.	38 16 56	2811	36 42 42	2797	35 8 10	2782	33 33 18	2766
	α Aquilæ	E.	69 52 25	3313	68 28 29	3311	67 4 30	3309	65 40 29	3307
	SUN	E.	98 9 0	3162	96 42 5	3146	95 14 51	3130	93 47 18	3114
22	Spica	W.	45 4 53	2666	46 42 19	2649	48 20 8	2631	49 58 21	2613
	SATURN	E.	25 33 48	2686	23 56 49	2669	22 19 28	2652	20 41 44	2634
	α Aquilæ	E.	58 40 32	3322	57 16 46	3330	55 53 9	3340	54 29 44	3352
	SUN	E.	86 24 25	3028	84 54 47	3009	83 24 45	2989	81 54 19	2971
23	Spica	W.	58 15 32	2522	59 56 14	2504	61 37 21	2485	63 18 55	2467
	α Aquilæ	E.	47 37 27	3468	46 16 27	3505	44 56 8	3548	43 36 37	3598
	SUN	E.	74 16 17	2876	72 43 28	2856	71 10 13	2836	69 36 32	2817
24	Spica	W.	71 53 21	2373	73 37 34	2355	75 22 14	2335	77 7 22	2317
	JUPITER	W.	24 51 20	2407	26 34 45	2387	28 18 39	2367	30 3 1	2348
	SUN	E.	61 41 44	2719	60 5 29	2699	58 28 48	2680	56 51 41	2661
25	Spica	W.	85 59 40	2228	87 47 26	2210	89 35 38	2194	91 24 15	2177
	JUPITER	W.	38 51 44	2256	40 38 49	2238	42 26 20	2220	44 14 17	2203
	SUN	E.	48 39 50	2571	47 0 15	2554	45 20 17	2538	43 39 56	2522
26	Spica	W.	100 33 22	2101	102 24 19	2087	104 15 38	2074	106 7 17	2061
	Antares	W.	55 5 57	2113	56 56 37	2098	58 47 39	2085	60 39 2	2071
	JUPITER	W.	53 20 11	2126	55 10 31	2112	57 1 12	2098	58 52 14	2085
	SATURN	W.	29 40 6	2120	31 30 35	2105	33 21 26	2092	35 12 37	2079
	SUN	E.	35 13 9	2457	33 30 55	2446	31 48 26	2438	30 5 46	2433
27	JUPITER	W.	68 12 4	2030	70 4 51	2021	71 57 52	2013	73 51 6	2005
	SATURN	W.	44 33 11	2025	46 26 7	2017	48 19 15	2009	50 12 36	2000
	SUN	E.	21 31 15	2439	19 48 36	2456	18 6 21	2481	16 24 41	2520

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	22 47 57.02	9.371	S. 7 38 24.5	+56.96	16 9.26	65.37	12 34.70	0.485
Frid.	2	22 51 41.63	9.350	7 15 34.2	57.22	16 9.02	65.30	12 22.80	0.506
Sat.	3	22 55 25.75	9.330	6 52 37.9	57.47	16 8.77	65.23	12 10.41	0.527
SUN.	4	22 59 9.38	9.310	6 29 35.9	+57.70	16 8.52	65.16	11 57.52	0.547
Mon.	5	23 2 52.53	9.291	6 6 28.7	57.91	16 8.27	65.09	11 44.16	0.566
Tues.	6	23 6 35.24	9.272	5 43 16.5	58.11	16 8.02	65.03	11 30.35	0.584
Wed.	7	23 10 17.52	9.254	5 19 59.8	+58.29	16 7.77	64.97	11 16.12	0.602
Thur.	8	23 13 59.37	9.237	4 56 39.0	58.46	16 7.52	64.91	11 1.46	0.619
Frid.	9	23 17 40.83	9.221	4 33 14.4	58.61	16 7.26	64.86	10 46.40	0.635
Sat.	10	23 21 21.91	9.206	4 9 46.5	+58.74	16 7.00	64.81	10 30.97	0.650
SUN.	11	23 25 2.64	9.192	3 46 15.5	58.86	16 6.74	64.76	10 15.19	0.665
Mon.	12	23 28 43.04	9.178	3 22 41.9	58.96	16 6.48	64.71	9 59.07	0.679
Tues.	13	23 32 23.11	9.165	2 59 6.1	+59.05	16 6.22	64.66	9 42.65	0.691
Wed.	14	23 36 2.90	9.154	2 35 28.3	59.12	16 5.96	64.62	9 25.93	0.702
Thur.	15	23 39 42.42	9.144	2 11 48.9	59.18	16 5.69	64.58	9 8.95	0.712
Frid.	16	23 43 21.72	9.134	1 48 8.4	+59.23	16 5.42	64.55	8 51.73	0.721
Sat.	17	23 47 0.80	9.125	1 24 27.0	59.26	16 5.15	64.52	8 34.31	0.730
SUN.	18	23 50 39.68	9.118	1 0 45.0	59.27	16 4.88	64.49	8 16.68	0.738
Mon.	19	23 54 18.38	9.112	0 37 2.8	+59.27	16 4.61	64.47	7 58.87	0.744
Tues.	20	23 57 56.94	9.106	S. 0 13 20.8	59.26	16 4.34	64.45	7 40.93	0.750
Wed.	21	0 1 35.37	9.101	N. 0 10 20.7	59.23	16 4.07	64.43	7 22.85	0.755
Thur.	22	0 5 13.71	9.098	0 34 1.3	+59.18	16 3.79	64.41	7 4.69	0.759
Frid.	23	0 8 51.97	9.095	0 57 40.8	59.12	16 3.51	64.40	6 46.44	0.762
Sat.	24	0 12 30.17	9.093	1 21 18.6	59.05	16 3.24	64.39	6 28.14	0.764
SUN.	25	0 16 8.33	9.092	1 44 54.6	+58.97	16 2.96	64.39	6 9.80	0.765
Mon.	26	0 19 46.47	9.092	2 8 28.1	58.86	16 2.69	64.38	5 51.45	0.765
Tues.	27	0 23 24.61	9.093	2 31 59.1	58.74	16 2.41	64.38	5 33.09	0.764
Wed.	28	0 27 2.78	9.094	2 55 27.0	+58.60	16 2.13	64.38	5 14.77	0.763
Thur.	29	0 30 41.00	9.096	3 18 51.5	58.44	16 1.86	64.39	4 56.48	0.761
Frid.	30	0 34 19.27	9.098	3 42 12.2	58.27	16 1.58	64.40	4 38.23	0.759
Sat.	31	0 37 57.60	9.101	4 5 28.7	58.09	16 1.31	64.41	4 20.05	0.756
SUN.	32	0 41 36.01	9.105	N. 4 28 40.7	+57.90	16 1.03	64.42	4 1.98	0.752

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^{s}.18$ from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	22 47 55.05	9.371	S. 7 38 36.4	+56.96	12 34.80	0.485	22 35 20.24
Frid.	2	22 51 39.70	9.350	7 15 46.0	57.22	12 22.90	0.506	22 39 16.80
Sat.	3	22 55 23.86	9.330	6 52 49.6	57.47	12 10.51	0.527	22 43 13.35
SUN.	4	22 59 7.53	9.310	6 29 47.4	+57.70	11 57.63	0.547	22 47 9.90
Mon.	5	23 2 50.72	9.291	6 6 40.0	57.91	11 44.27	0.566	22 51 6.45
Tues.	6	23 6 33.47	9.272	5 43 27.6	58.11	11 30.46	0.584	22 55 3.01
Wed.	7	23 10 15.79	9.254	5 20 10.7	+58.29	11 16.23	0.602	22 58 59.56
Thur.	8	23 13 57.68	9.237	4 56 49.7	58.46	11 1.57	0.619	23 2 56.11
Frid.	9	23 17 39.18	9.221	4 33 24.9	58.61	10 46.51	0.635	23 6 52.66
Sat.	10	23 21 20.30	9.206	4 9 56.8	+58.74	10 31.08	0.650	23 10 49.22
SUN.	11	23 25 1.07	9.192	3 46 25.6	58.86	10 15.30	0.665	23 14 45.77
Mon.	12	23 28 41.51	9.178	3 22 51.8	58.96	9 59.18	0.679	23 18 42.32
Tues.	13	23 32 21.63	9.165	2 59 15.7	+59.05	9 42.76	0.691	23 22 38.88
Wed.	14	23 36 1.47	9.154	2 35 37.7	59.12	9 26.04	0.702	23 26 35.43
Thur.	15	23 39 41.04	9.144	2 11 58.0	59.18	9 9.06	0.712	23 30 31.98
Frid.	16	23 43 20.38	9.134	1 48 17.2	+59.23	8 51.84	0.721	23 34 28.54
Sat.	17	23 46 59.50	9.125	1 24 35.5	59.26	8 34.41	0.730	23 38 25.09
SUN.	18	23 50 38.42	9.118	1 0 53.2	59.27	8 16.78	0.738	23 42 21.64
Mon.	19	23 54 17.17	9.112	0 37 10.7	+59.27	7 58.98	0.744	23 46 18.19
Tues.	20	23 57 55.77	9.106	S. 0 13 28.4	59.26	7 41.03	0.750	23 50 14.74
Wed.	21	0 1 34.25	9.101	N. 0 10 13.4	59.23	7 22.95	0.755	23 54 11.30
Thur.	22	0 5 12.63	9.098	0 33 54.3	+59.18	7 4.78	0.759	23 58 7.85
Frid.	23	0 8 50.93	9.095	0 57 34.1	59.12	6 46.53	0.762	0 2 4.40
Sat.	24	0 12 29.18	9.093	1 21 12.2	59.05	6 28.22	0.764	0 6 0.96
SUN.	25	0 16 7.39	9.092	1 44 48.5	+58.97	6 9.88	0.765	0 9 57.51
Mon.	26	0 19 45.58	9.092	2 8 22.3	58.86	5 51.52	0.765	0 13 54.06
Tues.	27	0 23 23.77	9.093	2 31 53.6	58.74	5 33.16	0.764	0 17 50.61
Wed.	28	0 27 1.99	9.094	2 55 21.8	+58.60	5 14.83	0.763	0 21 47.16
Thur.	29	0 30 40.25	9.096	3 18 46.7	58.44	4 56.54	0.761	0 25 43.72
Frid.	30	0 34 18.56	9.098	3 42 7.7	58.27	4 38.29	0.759	0 29 40.27
Sat.	31	0 37 56.94	9.101	4 5 24.5	58.09	4 20.12	0.756	0 33 36.82
SUN.	32	0 41 35.40	9.105	N. 4 28 36.8	+57.90	4 2.03	0.752	0 37 33.37

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	60	340 28 50.8	28 24.8	150.52	+ 0.73	9.9961871	+45.3	1 24 25.89
2	61	341 29 2.2	28 36.1	150.44	0.75	9.9962959	45.5	1 20 29.98
3	62	342 29 11.7	28 45.5	150.36	0.71	9.9964050	45.7	1 16 34.07
4	63	343 29 19.2	28 53.0	150.27	+ 0.63	9.9965146	+45.8	1 12 38.17
5	64	344 29 24.6	28 58.3	150.18	0.53	9.9966248	46.0	1 8 42.26
6	65	345 29 27.9	29 1.4	150.09	0.42	9.9967355	46.3	1 4 46.35
7	66	346 29 29.0	29 2.5	150.00	+ 0.31	9.9968468	+46.6	1 0 50.45
8	67	347 29 27.9	29 1.3	149.91	0.19	9.9969590	46.9	0 56 54.54
9	68	348 29 24.6	28 57.9	149.82	+ 0.07	9.9970721	47.3	0 52 58.63
10	69	349 29 19.2	28 52.4	149.73	− 0.05	9.9971862	+47.7	0 49 2.73
11	70	350 29 11.5	28 44.6	149.64	0.15	9.9973013	48.1	0 45 6.82
12	71	351 29 1.7	28 34.7	149.55	0.24	9.9974174	48.6	0 41 10.91
13	72	352 28 49.7	28 22.6	149.46	− 0.30	9.9975347	+49.1	0 37 15.00
14	73	353 28 35.7	28 8.5	149.37	0.33	9.9976531	49.6	0 33 19.10
15	74	354 28 19.6	27 52.3	149.28	0.34	9.9977727	50.1	0 29 23.19
16	75	355 28 1.4	27 34.0	149.20	− 0.33	9.9978933	+50.5	0 25 27.28
17	76	356 27 41.3	27 13.8	149.12	0.29	9.9980151	51.0	0 21 31.38
18	77	357 27 19.2	26 51.6	149.04	0.22	9.9981379	51.4	0 17 35.47
19	78	358 26 55.2	26 27.6	148.96	− 0.14	9.9982617	+51.8	0 13 39.56
20	79	359 26 29.4	26 1.6	148.89	− 0.04	9.9983864	52.1	0 9 43.66
21	80	0 26 1.7	25 33.8	148.81	+ 0.09	9.9985120	52.4	0 5 47.75
22	81	1 25 32.2	25 4.3	148.74	+ 0.22	9.9986382	+52.7	0 1 51.84 23 57 55.93
23	82	2 25 1.0	24 33.0	148.66	0.35	9.9987650	52.9	23 54 0.02
24	83	3 24 28.0	23 59.9	148.59	0.47	9.9988921	53.0	23 50 4.12
25	84	4 23 53.2	23 25.0	148.51	+ 0.59	9.9990195	+53.0	23 46 8.22
26	85	5 23 16.8	22 48.5	148.44	0.68	9.9991468	53.0	23 42 12.31
27	86	6 22 38.5	22 10.1	148.36	0.74	9.9992741	52.9	23 38 16.40
28	87	7 21 58.4	21 30.0	148.29	+ 0.78	9.9994011	+52.8	23 34 20.50
29	88	8 21 16.5	20 48.0	148.21	0.78	9.9995275	52.6	23 30 24.59
30	89	9 20 32.6	20 4.0	148.13	0.76	9.9996534	52.4	23 26 28.68
31	90	10 19 46.7	19 18.0	148.05	0.70	9.9997786	52.1	23 22 32.78
32	91	11 18 58.8	18 29.9	147.96	+ 0.61	9.9999032	+51.8	23 18 36.87

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0.^{d}0$.

Diff. for 1 Hour, $-9^{s}.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 46.7	16 45.9	61 28.0	0.00	61 25.4	−0.43	0 6.6	2.28	0.0
2	16 43.8	16 40.4	61 17.7	−0.84	61 5.2	1.22	1 1.0	2.26	1.0
3	16 35.9	16 30.3	60 48.4	1.56	60 27.8	1.85	1 55.4	2.27	2.0
4	16 23.8	16 16.7	60 4.1	−2.07	59 38.0	−2.23	2 50.3	2.31	3.0
5	16 9.2	16 1.4	59 10.4	2.34	58 41.8	2.39	3 45.7	2.32	4.0
6	15 53.6	15 45.8	58 13.0	2.38	57 44.6	2.34	4 41.3	2.32	5.0
7	15 38.3	15 31.1	57 16.9	−2.25	56 50.4	−2.14	5 36.5	2.28	6.0
8	15 24.3	15 17.9	56 25.4	2.00	56 2.2	1.85	6 30.4	2.21	7.0
9	15 12.1	15 6.9	55 40.9	1.69	55 21.7	1.52	7 22.2	2.11	8.0
10	15 2.2	14 58.1	55 4.5	−1.34	54 49.4	−1.17	8 11.4	2.00	9.0
11	14 54.6	14 51.6	54 36.4	1.00	54 25.3	0.84	8 58.0	1.89	10.0
12	14 49.1	14 47.1	54 16.3	0.68	54 9.0	0.53	9 42.3	1.80	11.0
13	14 45.6	14 44.6	54 3.5	−0.39	53 59.6	−0.25	10 24.8	1.74	12.0
14	14 43.9	14 43.7	53 57.3	−0.13	53 56.4	−0.01	11 6.2	1.71	13.0
15	14 43.8	14 44.3	53 57.0	+0.10	53 58.8	+0.21	11 47.1	1.71	14.0
16	14 45.2	14 46.4	54 2.0	+0.31	54 6.4	+0.42	12 28.4	1.73	15.0
17	14 48.0	14 49.8	54 12.1	0.52	54 19.0	0.63	13 10.6	1.79	16.0
18	14 52.1	14 54.7	54 27.2	0.74	54 36.7	0.85	13 54.6	1.88	17.0
19	14 57.6	15 1.0	54 47.6	+0.96	54 59.8	+1.08	14 40.8	1.98	18.0
20	15 4.7	15 8.8	55 13.6	1.20	55 28.8	1.33	15 29.6	2.09	19.0
21	15 13.4	15 18.4	55 45.5	1.45	56 3.8	1.58	16 21.1	2.19	20.0
22	15 23.7	15 29.5	56 23.5	+1.70	56 44.7	+1.82	17 14.7	2.27	21.0
23	15 35.6	15 42.1	57 7.2	1.92	57 30.8	2.00	18 9.8	2.31	22.0
24	15 48.7	15 55.6	57 55.3	2.07	58 20.4	2.10	19 5.4	2.32	23.0
25	16 2.5	16 9.3	58 45.7	+2.10	59 10.8	+2.05	20 0.8	2.29	24.0
26	16 15.9	16 22.1	59 35.1	1.96	59 58.0	1.82	20 55.5	2.27	25.0
27	16 27.8	16 32.8	60 18.8	1.63	60 37.0	1.38	21 49.6	2.25	26.0
28	16 36.8	16 39.8	60 51.9	+1.08	61 2.9	+0.74	22 43.5	2.25	27.0
29	16 41.7	16 42.2	61 9.7	+0.37	61 11.8	−0.03	23 37.8	2.28	28.0
30	16 41.5	16 39.5	61 9.1	−0.42	61 1.6	0.81	ó		29.0
31	16 36.2	16 31.7	60 49.5	1.18	60 33.2	1.52	0 33.1	2.33	0.6
32	16 26.3	16 19.9	60 13.1	−1.80	59 49.9	−2.03	1 29.5	2.37	1.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 1.					SATURDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 41 39.48	2.3598	S. 2 54 0.6	14.699	0	0 34 27.18	2.3536	N. 8 38 15.3	13.463
1	22 44 1.04	2.3588	2 39 18.1	14.716	1	0 36 48.41	2.3542	8 51 41.1	13.396
2	22 46 22.54	2.3579	2 24 34.7	14.731	2	0 39 9.68	2.3548	9 5 2.8	13.327
3	22 48 43.99	2.3571	2 9 50.4	14.744	3	0 41 30.99	2.3555	9 18 20.3	13.257
4	22 51 5.39	2.3562	1 55 5.3	14.755	4	0 43 52.34	2.3562	9 31 33.6	13.185
5	22 53 26.73	2.3552	1 40 19.7	14.764	5	0 46 13.73	2.3569	9 44 42.5	13.112
6	22 55 48.02	2.3544	1 25 33.6	14.772	6	0 48 35.17	2.3577	9 57 47.0	13.037
7	22 58 9.26	2.3537	1 10 47.0	14.779	7	0 50 56.66	2.3585	10 10 46.9	12.961
8	23 0 30.46	2.3530	0 56 0.1	14.783	8	0 53 18.19	2.3592	10 23 42.3	12.883
9	23 2 51.62	2.3523	0 41 13.1	14.784	9	0 55 39.77	2.3601	10 36 32.9	12.803
10	23 5 12.74	2.3517	0 26 26.0	14.784	10	0 58 1.40	2.3609	10 49 18.7	12.723
11	23 7 33.82	2.3510	S. 0 11 39.0	14.782	11	1 0 23.08	2.3617	11 1 59.7	12.642
12	23 9 54.86	2.3504	N. 0 3 7.9	14.779	12	1 2 44.81	2.3626	11 14 35.7	12.558
13	23 12 15.87	2.3499	0 17 54.5	14.774	13	1 5 6.59	2.3635	11 27 6.7	12.473
14	23 14 36.85	2.3494	0 32 40.8	14.767	14	1 7 28.43	2.3644	11 39 32.5	12.387
15	23 16 57.80	2.3489	0 47 26.6	14.757	15	1 9 50.32	2.3652	11 51 53.2	12.300
16	23 19 18.72	2.3485	1 2 11.7	14.747	16	1 12 12.26	2.3661	12 4 8.6	12.212
17	23 21 39.62	2.3481	1 16 56.2	14.734	17	1 14 34.25	2.3670	12 16 18.6	12.122
18	23 24 0.49	2.3477	1 31 39.8	14.719	18	1 16 56.30	2.3679	12 28 23.2	12.030
19	23 26 21.35	2.3475	1 46 22.5	14.702	19	1 19 18.40	2.3688	12 40 22.2	11.938
20	23 28 42.19	2.3472	2 1 4.1	14.684	20	1 21 40.56	2.3698	12 52 15.7	11.845
21	23 31 3.01	2.3469	2 15 44.6	14.664	21	1 24 2.78	2.3707	13 4 3.6	11.750
22	23 33 23.82	2.3467	2 30 23.8	14.642	22	1 26 25.05	2.3717	13 15 45.7	11.653
23	23 35 44.62	2.3466	N. 2 45 1.7	14.619	23	1 28 47.38	2.3726	N. 13 27 22.0	11.557
	FRIDAY 2.					SUNDAY 4.			
0	23 38 5.41	2.3464	N. 2 59 38.1	14.593	0	1 31 9.76	2.3735	N. 13 38 52.5	11.458
1	23 40 26.19	2.3463	3 14 12.9	14.566	1	1 33 32.20	2.3744	13 50 17.0	11.358
2	23 42 46.97	2.3463	3 28 46.0	14.537	2	1 35 54.69	2.3753	14 1 35.5	11.258
3	23 45 7.75	2.3463	3 43 17.3	14.506	3	1 38 17.24	2.3763	14 12 48.0	11.157
4	23 47 28.53	2.3463	3 57 46.7	14.473	4	1 40 39.85	2.3772	14 23 54.3	11.053
5	23 49 49.31	2.3463	4 12 14.1	14.439	5	1 43 2.51	2.3781	14 34 54.4	10.949
6	23 52 10.09	2.3464	4 26 39.4	14.402	6	1 45 25.22	2.3790	14 45 48.2	10.844
7	23 54 30.88	2.3466	4 41 2.4	14.364	7	1 47 47.99	2.3799	14 56 35.7	10.738
8	23 56 51.68	2.3467	4 55 23.1	14.325	8	1 50 10.81	2.3808	15 7 16.8	10.631
9	23 59 12.49	2.3469	5 9 41.4	14.283	9	1 52 33.69	2.3817	15 17 51.4	10.522
10	0 1 33.31	2.3472	5 23 57.1	14.240	10	1 54 56.62	2.3826	15 28 19.5	10.414
11	0 3 54.15	2.3474	5 38 10.2	14.196	11	1 57 19.60	2.3834	15 38 41.1	10.305
12	0 6 15.00	2.3477	5 52 20.6	14.149	12	1 59 42.63	2.3843	15 48 56.1	10.193
13	0 8 35.87	2.3480	6 6 28.1	14.101	13	2 2 5.72	2.3852	15 59 4.3	10.082
14	0 10 56.76	2.3483	6 20 32.7	14.052	14	2 4 28.85	2.3859	16 9 5.9	9.969
15	0 13 17.67	2.3487	6 34 34.3	14.000	15	2 6 52.03	2.3867	16 19 0.6	9.854
16	0 15 38.61	2.3492	6 48 32.7	13.946	16	2 9 15.26	2.3875	16 28 48.4	9.740
17	0 17 59.58	2.3497	7 2 27.8	13.892	17	2 11 38.53	2.3882	16 38 29.4	9.625
18	0 20 20.57	2.3501	7 16 19.7	13.836	18	2 14 1.85	2.3890	16 48 3.4	9.509
19	0 22 41.59	2.3506	7 30 8.1	13.777	19	2 16 25.21	2.3897	16 57 30.5	9.392
20	0 25 2.64	2.3511	7 43 52.9	13.717	20	2 18 48.62	2.3905	17 6 50.5	9.273
21	0 27 23.72	2.3517	7 57 34.2	13.657	21	2 21 12.07	2.3912	17 16 3.3	9.155
22	0 29 44.84	2.3522	8 11 11.8	13.594	22	2 23 35.56	2.3917	17 25 9.1	9.037
23	0 32 5.99	2.3528	8 24 45.5	13.529	23	2 25 59.08	2.3923	17 34 7.7	8.916
24	0 34 27.18	2.3535	N. 8 38 15.3	13.463	24	2 28 22.64	2.3929	N. 17 42 59.0	8.795

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 5.					WEDNESDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 28 22.64	2.3929	N.17 42 59.0	8.795	0	4 23 9.64	2.3707	N.22 17 2.0	2.535
1	2 30 46.23	2.3935	17 51 43.1	8.673	1	4 25 31.83	2.3689	22 19 30.1	2.402
2	2 33 9.86	2.3941	18 0 19.8	8.551	2	4 27 53.91	2.3671	22 21 50.2	2.269
3	2 35 33.52	2.3946	18 8 49.2	8.428	3	4 30 15.88	2.3652	22 24 2.4	2.137
4	2 37 57.21	2.3950	18 17 11.2	8.305	4	4 32 37.73	2.3632	22 26 6.7	2.005
5	2 40 20.92	2.3954	18 25 25.8	8.181	5	4 34 59.47	2.3612	22 28 3.0	1.873
6	2 42 44.66	2.3958	18 33 32.9	8.056	6	4 37 21.08	2.3592	22 29 51.5	1.743
7	2 45 8.42	2.3963	18 41 32.6	7.931	7	4 39 42.57	2.3571	22 31 32.2	1.612
8	2 47 32.21	2.3967	18 49 24.7	7.805	8	4 42 3.93	2.3549	22 33 5.0	1.481
9	2 49 56.02	2.3969	18 57 9.2	7.678	9	4 44 25.16	2.3527	22 34 29.9	1.351
10	2 52 19.84	2.3971	19 4 46.1	7.552	10	4 46 46.25	2.3505	22 35 47.1	1.221
11	2 54 43.67	2.3973	19 12 15.4	7.424	11	4 49 7.20	2.3480	22 36 56.4	1.091
12	2 57 7.52	2.3976	19 19 37.0	7.297	12	4 51 28.01	2.3457	22 37 58.0	0.962
13	2 59 31.38	2.3977	19 26 51.0	7.168	13	4 53 48.68	2.3432	22 38 51.8	0.832
14	3 1 55.24	2.3977	19 33 57.2	7.039	14	4 56 9.19	2.3406	22 39 37.9	0.704
15	3 4 19.11	2.3978	19 40 55.7	6.910	15	4 58 29.55	2.3381	22 40 16.3	0.576
16	3 6 42.98	2.3977	19 47 46.4	6.780	16	5 0 49.76	2.3355	22 40 47.0	0.448
17	3 9 6.84	2.3977	19 54 29.3	6.651	17	5 3 9.81	2.3328	22 41 10.1	0.321
18	3 11 30.70	2.3977	20 1 4.5	6.521	18	5 5 29.70	2.3302	22 41 25.5	0.193
19	3 13 54.56	2.3976	20 7 31.8	6.389	19	5 7 49.43	2.3274	22 41 33.3	+ 0.067
20	3 16 18.41	2.3973	20 13 51.2	6.258	20	5 10 8.99	2.3245	22 41 33.6	− 0.057
21	3 18 42.24	2.3971	20 20 2.8	6.127	21	5 12 28.37	2.3216	22 41 26.4	0.183
22	3 21 6.06	2.3968	20 26 6.5	5.996	22	5 14 47.58	2.3187	22 41 11.6	0.309
23	3 23 29.86	2.3965	N.20 32 2.3	5.863	23	5 17 6.62	2.3158	N.22 40 49.3	0.434
	TUESDAY 6.					THURSDAY 8.			
0	3 25 53.64	2.3961	N.20 37 50.1	5.731	0	5 19 25.48	2.3128	N.22 40 19.5	0.558
1	3 28 17.39	2.3957	20 43 30.0	5.599	1	5 21 44.16	2.3097	22 39 42.3	0.681
2	3 30 41.12	2.3952	20 49 2.0	5.467	2	5 24 2.65	2.3066	22 38 57.7	0.804
3	3 33 4.82	2.3947	20 54 26.0	5.334	3	5 26 20.95	2.3034	22 38 5.8	0.927
4	3 35 28.48	2.3941	20 59 42.1	5.201	4	5 28 39.06	2.3002	22 37 6.5	1.049
5	3 37 52.11	2.3935	21 4 50.1	5.067	5	5 30 56.98	2.2971	22 35 59.9	1.170
6	3 40 15.70	2.3927	21 9 50.2	4.935	6	5 33 14.71	2.2938	22 34 46.1	1.291
7	3 42 39.24	2.3920	21 14 42.3	4.801	7	5 35 32.23	2.2904	22 33 25.0	1.412
8	3 45 2.74	2.3912	21 19 26.3	4.667	8	5 37 49.56	2.2871	22 31 56.7	1.531
9	3 47 26.19	2.3903	21 24 2.4	4.535	9	5 40 6.68	2.2836	22 30 21.3	1.649
10	3 49 49.58	2.3894	21 28 30.5	4.401	10	5 42 23.59	2.2802	22 28 38.8	1.768
11	3 52 12.92	2.3885	21 32 50.5	4.267	11	5 44 40.30	2.2767	22 26 49.1	1.887
12	3 54 36.20	2.3875	21 37 2.5	4.133	12	5 46 56.80	2.2732	22 24 52.3	2.005
13	3 56 59.42	2.3864	21 41 6.5	3.999	13	5 49 13.08	2.2696	22 22 48.5	2.121
14	3 59 22.57	2.3852	21 45 2.4	3.866	14	5 51 29.15	2.2660	22 20 37.8	2.237
15	4 1 45.65	2.3840	21 48 50.4	3.732	15	5 53 45.00	2.2623	22 18 20.1	2.352
16	4 4 8.65	2.3827	21 52 30.4	3.598	16	5 56 0.63	2.2587	22 15 55.5	2.467
17	4 6 31.58	2.3815	21 56 2.3	3.465	17	5 58 16.05	2.2551	22 13 24.1	2.581
18	4 8 54.43	2.3802	21 59 26.2	3.332	18	6 0 31.24	2.2513	22 10 45.8	2.695
19	4 11 17.20	2.3787	22 2 42.1	3.199	19	6 2 46.20	2.2475	22 8 0.7	2.807
20	4 13 39.88	2.3772	22 5 50.1	3.066	20	6 5 0.94	2.2437	22 5 8.9	2.919
21	4 16 2.47	2.3757	22 8 50.0	2.932	21	6 7 15.45	2.2399	22 2 10.4	3.031
22	4 18 24.96	2.3740	22 11 41.9	2.799	22	6 9 29.73	2.2361	21 59 5.2	3.142
23	4 20 47.35	2.3723	22 14 25.9	2.667	23	6 11 43.78	2.2322	21 55 53.4	3.252
24	4 23 9.64	2.3707	N.22 17 2.0	2.535	24	6 13 57.60	2.2283	N.21 52 35.0	3.361

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 9.					**SUNDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 13 57.60	2.2283	N.21 52 35.0	3.361	0	7 56 12.09	2.0317	N.17 19 23.4	7.728
1	6 16 11.18	2.2244	21 49 10.1	3.469	1	7 58 13.88	2.0279	17 11 37.6	7.800
2	6 18 24 53	2.2205	21 45 38.7	3.577	2	8 0 15.44	2.0241	17 3 47.4	7.872
3	6 20 37.64	2.2165	21 42 0.8	3.685	3	8 2 16.77	2.0202	16 55 53.0	7.942
4	6 22 50.51	2.2125	21 38 16.5	3.792	4	8 4 17.86	2.0163	16 47 54.4	8.011
5	6 25 3.14	2.2085	21 34 25.8	3.897	5	8 6 18.73	2.0125	16 39 51.7	8.080
6	6 27 15.53	2.2045	21 30 28.8	4.002	6	8 8 19.36	2.0087	16 31 44.8	8.149
7	6 29 27.68	2.2005	21 26 25.6	4.106	7	8 10 19.77	2.0050	16 23 33.8	8.217
8	6 31 39.59	2.1964	21 22 16.1	4.210	8	8 12 19.96	2.0012	16 15 18.8	8.283
9	6 33 51.25	2.1922	21 18 0.4	4.312	9	8 14 19.92	1.9975	16 6 59.8	8.349
10	6 36 2.66	2.1882	21 13 38.6	4.415	10	8 16 19.66	1.9938	15 58 36.9	8.414
11	6 38 13.83	2.1841	21 9 10.6	4.517	11	8 18 19.18	1.9902	15 50 10.1	8.479
12	6 40 24.75	2.1800	21 4 36.6	4.617	12	8 20 18.49	1.9867	15 41 39.4	8.542
13	6 42 35.43	2.1759	20 59 56.6	4.717	13	8 22 17.58	1.9830	15 33 5.0	8.605
14	6 44 45.86	2.1717	20 55 10.6	4.816	14	8 24 16.45	1.9794	15 24 26.8	8.667
15	6 46 56.04	2.1676	20 50 18.7	4.914	15	8 26 15.11	1.9758	15 15 44.9	8.729
16	6 49 5.97	2.1634	20 45 20.9	5.012	16	8 28 13.55	1.9723	15 6 59.3	8.790
17	6 51 15.65	2.1593	20 40 17.2	5.109	17	8 30 11.79	1.9689	14 58 10.1	8.850
18	6 53 25.09	2.1552	20 35 7.8	5.204	18	8 32 9.82	1.9655	14 49 17.3	8.909
19	6 55 34.27	2.1509	20 29 52.7	5.300	19	8 34 7.65	1.9621	14 40 21.0	8.967
20	6 57 43.20	2.1467	20 24 31.8	5.395	20	8 36 5.27	1.9587	14 31 21.2	9.025
21	6 59 51.88	2.1426	20 19 5.3	5.488	21	8 38 2.69	1.9553	14 22 18.0	9.082
22	7 2 0.31	2.1383	20 13 33.2	5.582	22	8 39 59.91	1.9520	14 13 11.4	9.138
23	7 4 8.48	2.1341	N.20 7 55.5	5.674	23	8 41 56.93	1.9487	N.14 4 1.4	9.193
	SATURDAY 10.					**MONDAY 12.**			
0	7 6 16.40	2.1299	N.20 2 12.3	5.766	0	8 43 53.76	1.9455	N.13 54 48.2	9.247
1	7 8 24.07	2.1257	19 56 23.6	5.857	1	8 45 50.39	1.9422	13 45 31.7	9.302
2	7 10 31.49	2.1217	19 50 29.5	5.946	2	8 47 46.83	1.9391	13 36 11.9	9.357
3	7 12 38.67	2.1175	19 44 30.1	6.035	3	8 49 43.08	1.9360	13 26 48.9	9.409
4	7 14 45.59	2.1132	19 38 25.3	6.123	4	8 51 39.15	1.9329	13 17 22.8	9.461
5	7 16 52.25	2.1090	19 32 15.3	6.211	5	8 53 35.03	1.9298	13 7 53.6	9.512
6	7 18 58.67	2.1049	19 26 0.0	6.298	6	8 55 30.73	1.9268	12 58 21.4	9.562
7	7 21 4.84	2.1007	19 19 39.5	6.384	7	8 57 26.25	1.9238	12 48 46.1	9.612
8	7 23 10.76	2.0966	19 13 13.9	6.469	8	8 59 21.59	1.9208	12 39 7.9	9.662
9	7 25 16.43	2.0924	19 6 43.2	6.554	9	9 1 16.75	1.9179	12 29 26.7	9.710
10	7 27 21.85	2.0883	19 0 7.4	6.638	10	9 3 11.74	1.9151	12 19 42.7	9.757
11	7 29 27.03	2.0842	18 53 26.6	6.720	11	9 5 6.56	1.9122	12 9 55.9	9.803
12	7 31 31.96	2.0801	18 46 41.0	6.802	12	9 7 1.21	1.9094	12 0 6.3	9.850
13	7 33 36.64	2.0760	18 39 50.4	6.883	13	9 8 55.69	1.9067	11 50 13.9	9.896
14	7 35 41.08	2.0719	18 32 55.0	6.964	14	9 10 50.01	1.9040	11 40 18.8	9.940
15	7 37 45.27	2.0677	18 25 54.7	7.044	15	9 12 44.17	1.9012	11 30 21.1	9.984
16	7 39 49.21	2.0637	18 18 49.7	7.123	16	9 14 38.16	1.8986	11 20 20.7	10.027
17	7 41 52.91	2.0597	18 11 39.9	7.202	17	9 16 32.00	1.8961	11 10 17.7	10.070
18	7 43 56.37	2.0557	18 4 25.5	7.278	18	9 18 25.69	1.8935	11 0 12.2	10.112
19	7 45 59.59	2.0517	17 57 6.5	7.355	19	9 20 19.22	1.8909	10 50 4.2	10.153
20	7 48 2.57	2.0477	17 49 42.9	7.432	20	9 22 12.60	1.8885	10 39 53.8	10.194
21	7 50 5.31	2.0437	17 42 14.7	7.507	21	9 24 5.84	1.8861	10 29 40.9	10.234
22	7 52 7.81	2.0397	17 34 42.1	7.581	22	9 25 58.93	1.8837	10 19 25.7	10.273
23	7 54 10.07	2.0357	17 27 5.0	7.655	23	9 27 51.88	1.8813	10 9 8.2	10.312
24	7 56 12.09	2.0317	N.17 19 23.4	7.728	24	9 29 44.69	1.8790	N. 9 58 48.3	10.350

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 13.					THURSDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 29 44.69	1.8790	N. 9 58 48.3	10.350	0	10 58 7.84	1.8215	N. 1 11 28.2	11.365
1	9 31 37.36	1.8767	9 48 26.2	10.387	1	10 59 57.13	1.8214	1 0 6.1	11.370
2	9 33 29.90	1.8745	9 38 1.9	10.422	2	11 1 46.41	1.8214	0 48 43.8	11.374
3	9 35 22.30	1.8723	9 27 35.5	10.457	3	11 3 35.70	1.8215	0 37 21.2	11.377
4	9 37 14.58	1.8702	9 17 7.0	10.492	4	11 5 24.99	1.8216	0 25 58.5	11.380
5	9 39 6.73	1.8681	9 6 36.4	10.527	5	11 7 14.29	1.8217	0 14 35.6	11.382
6	9 40 58.75	1.8660	8 56 3.7	10.562	6	11 9 3.60	1.8219	N. 0 3 12.6	11.384
7	9 42 50.65	1.8641	8 45 29.0	10.594	7	11 10 52.92	1.8222	S. 0 8 10.5	11.385
8	9 44 42.44	1.8622	8 34 52.4	10.626	8	11 12 42.26	1.8224	0 19 33.6	11.385
9	9 46 34.11	1.8602	8 24 13.9	10.657	9	11 14 31.61	1.8227	0 30 56.7	11.384
10	9 48 25.66	1.8583	8 13 33.5	10.688	10	11 16 20.99	1.8232	0 42 19.7	11.382
11	9 50 17.11	1.8566	8 2 51.3	10.719	11	11 18 10.39	1.8236	0 53 42.6	11.381
12	9 52 8.45	1.8547	7 52 7.2	10.749	12	11 19 59.82	1.8241	1 5 5.4	11.378
13	9 53 59.68	1.8530	7 41 21.4	10.777	13	11 21 49.28	1.8246	1 16 28.0	11.375
14	9 55 50.81	1.8513	7 30 33.9	10.805	14	11 23 38.77	1.8252	1 27 50.4	11.372
15	9 57 41.84	1.8497	7 19 44.8	10.832	15	11 25 28.30	1.8257	1 39 12.6	11.367
16	9 59 32.77	1.8481	7 8 54.0	10.860	16	11 27 17.86	1.8264	1 50 34.5	11.362
17	10 1 23.61	1.8465	6 58 1.6	10.886	17	11 29 7.47	1.8272	2 1 56.0	11.356
18	10 3 14.35	1.8450	6 47 7.7	10.912	18	11 30 57.12	1.8279	2 13 17.2	11.349
19	10 5 5.01	1.8436	6 36 12.2	10.937	19	11 32 46.82	1.8287	2 24 37.9	11.342
20	10 6 55.58	1.8422	6 25 15.3	10.961	20	11 34 36.57	1.8296	2 35 58.2	11.333
21	10 8 46.07	1.8407	6 14 16.9	10.984	21	11 36 26.37	1.8305	2 47 17.9	11.325
22	10 10 36.47	1.8394	6 3 17.2	11.007	22	11 38 16.23	1.8314	2 58 37.2	11.316
23	10 12 26.80	1.8382	N. 5 52 16.1	11.028	23	11 40 6.14	1.8323	S. 3 9 55.8	11.305
	WEDNESDAY 14.					FRIDAY 16.			
0	10 14 17.05	1.8369	N. 5 41 13.8	11.049	0	11 41 56.11	1.8334	S. 3 21 13.8	11.294
1	10 16 7.23	1.8358	5 30 10.2	11.071	1	11 43 46.15	1.8346	3 32 31.1	11.282
2	10 17 57.34	1.8346	5 19 5.3	11.092	2	11 45 36.26	1.8357	3 43 47.7	11.271
3	10 19 47.38	1.8335	5 7 59.2	11.111	3	11 47 26.43	1.8368	3 55 3.6	11.258
4	10 21 37.36	1.8325	4 56 52.0	11.129	4	11 49 16.68	1.8381	4 6 18.7	11.245
5	10 23 27.28	1.8315	4 45 43.7	11.147	5	11 51 7.00	1.8393	4 17 33.0	11.230
6	10 25 17.14	1.8306	4 34 34.3	11.165	6	11 52 57.40	1.8407	4 28 46.3	11.215
7	10 27 6.95	1.8297	4 23 23.9	11.182	7	11 54 47.88	1.8421	4 39 58.8	11.200
8	10 28 56.70	1.8288	4 12 12.5	11.198	8	11 56 38.45	1.8435	4 51 10.3	11.183
9	10 30 46.40	1.8280	4 1 0.1	11.214	9	11 58 29.10	1.8449	5 2 20.8	11.166
10	10 32 36.06	1.8272	3 49 46.8	11.228	10	12 0 19.84	1.8464	5 13 30.2	11.148
11	10 34 25.67	1.8264	3 38 32.7	11.242	11	12 2 10.67	1.8480	5 24 38.6	11.130
12	10 36 15.23	1.8257	3 27 17.7	11.256	12	12 4 1.60	1.8497	5 35 45.8	11.111
13	10 38 4.76	1.8252	3 16 2.0	11.268	13	12 5 52.63	1.8513	5 46 51.9	11.091
14	10 39 54.25	1.8246	3 4 45.5	11.281	14	12 7 43.75	1.8529	5 57 56.7	11.070
15	10 41 43.71	1.8241	2 53 28.3	11.292	15	12 9 34.98	1.8547	6 9 0.3	11.049
16	10 43 33.14	1.8236	2 42 10.4	11.303	16	12 11 26.31	1.8564	6 20 2.6	11.027
17	10 45 22.54	1.8232	2 30 51.9	11.313	17	12 13 17.75	1.8582	6 31 3.6	11.005
18	10 47 11.92	1.8228	2 19 32.8	11.322	18	12 15 9.30	1.8602	6 42 3.2	10.982
19	10 49 1.28	1.8225	2 8 13.2	11.331	19	12 17 0.97	1.8621	6 53 1.4	10.957
20	10 50 50.62	1.8222	1 56 53.1	11.339	20	12 18 52.75	1.8640	7 3 58.0	10.932
21	10 52 39.94	1.8219	1 45 32.4	11.347	21	12 20 44.65	1.8660	7 14 53.2	10.907
22	10 54 29.25	1.8217	1 34 11.3	11.354	22	12 22 36.67	1.8681	7 25 46.8	10.880
23	10 56 18.55	1.8216	1 22 49.9	11.359	23	12 24 28.82	1.8702	7 36 38.8	10.852
24	10 58 7.84	1.8215	N. 1 11 28.2	11.365	24	12 26 21.09	1.8722	S. 7 47 29.1	10.825

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 17.					MONDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 26 21.09	1.8722	S. 7 47 29.1	10.825	0	13 59 26.93	2.0205	S. 15 40 45.5	8.595
1	12 28 13.49	1.8744	7 58 17.8	10.797	1	14 1 28.28	2.0244	15 49 19.2	8.528
2	12 30 6.02	1.8767	8 9 4.7	10.767	2	14 3 29.86	2.0283	15 57 48.9	8.462
3	12 31 58.69	1.8790	8 19 49.9	10.737	3	14 5 31.68	2.0322	16 6 14.7	8.395
4	12 33 51.50	1.8812	8 30 33.2	10.707	4	14 7 33.73	2.0362	16 14 36.3	8.326
5	12 35 44.44	1.8836	8 41 14.7	10.676	5	14 9 36.02	2.0402	16 22 53.8	8.257
6	12 37 37.53	1.8860	8 51 54.3	10.643	6	14 11 38.55	2.0442	16 31 7.1	8.187
7	12 39 30.76	1.8884	9 2 31.9	10.610	7	14 13 41.32	2.0481	16 39 16.2	8.116
8	12 41 24.14	1.8909	9 13 7.5	10.577	8	14 15 44.32	2.0521	16 47 21.0	8.044
9	12 43 17.67	1.8934	9 23 41.1	10.542	9	14 17 47.57	2.0562	16 55 21.5	7.972
10	12 45 11.35	1.8960	9 34 12.6	10.507	10	14 19 51.07	2.0603	17 3 17.6	7.898
11	12 47 5.19	1.8987	9 44 41.9	10.470	11	14 21 54.81	2.0643	17 11 9.2	7.823
12	12 48 59.19	1.9012	9 55 9.0	10.434	12	14 23 58.79	2.0684	17 18 56.4	7.749
13	12 50 53.34	1.9039	10 5 34.0	10.397	13	14 26 3.02	2.0725	17 26 39.1	7.673
14	12 52 47.66	1.9067	10 15 56.6	10.358	14	14 28 7.49	2.0766	17 34 17.2	7.596
15	12 54 42.14	1.9094	10 26 17.0	10.320	15	14 30 12.21	2.0807	17 41 50.6	7.518
16	12 56 36.79	1.9122	10 36 35.0	10.280	16	14 32 17.18	2.0848	17 49 19.4	7.440
17	12 58 31.61	1.9151	10 46 50.6	10.240	17	14 34 22.39	2.0890	17 56 43.4	7.361
18	13 0 26.60	1.9180	10 57 3.8	10.198	18	14 36 27.86	2.0932	18 4 2.7	7.281
19	13 2 21.77	1.9209	11 7 14.4	10.156	19	14 38 33.58	2.0973	18 11 17.1	7.200
20	13 4 17.11	1.9238	11 17 22.5	10.113	20	14 40 39.54	2.1015	18 18 26.7	7.118
21	13 6 12.63	1.9268	11 27 28.0	10.070	21	14 42 45.76	2.1057	18 25 31.4	7.036
22	13 8 8.33	1.9299	11 37 30.9	10.026	22	14 44 52.23	2.1099	18 32 31.1	6.952
23	13 10 4.22	1.9330	S. 11 47 31.2	9.980	23	14 46 58.95	2.1142	S. 18 39 25.7	6.867
	SUNDAY 18.					TUESDAY 20.			
0	13 12 0.29	1.9361	S. 11 57 28.6	9.934	0	14 49 5.93	2.1184	S. 18 46 15.2	6.782
1	13 13 56.55	1.9392	12 7 23.3	9.888	1	14 51 13.16	2.1226	18 52 59.6	6.697
2	13 15 53.00	1.9424	12 17 15.2	9.841	2	14 53 20.64	2.1267	18 59 38.9	6.611
3	13 17 49.64	1.9456	12 27 4.2	9.792	3	14 55 28.37	2.1309	19 6 12.9	6.523
4	13 19 46.47	1.9488	12 36 50.3	9.743	4	14 57 36.35	2.1352	19 12 41.7	6.435
5	13 21 43.50	1.9522	12 46 33.4	9.693	5	14 59 44.59	2.1394	19 19 5.1	6.345
6	13 23 40.73	1.9555	12 56 13.5	9.643	6	15 1 53.08	2.1436	19 25 23.1	6.256
7	13 25 38.16	1.9588	13 5 50.6	9.592	7	15 4 1.82	2.1477	19 31 35.8	6.165
8	13 27 35.79	1.9622	13 15 24.5	9.539	8	15 6 10.81	2.1519	19 37 42.9	6.073
9	13 29 33.63	1.9657	13 24 55.3	9.487	9	15 8 20.05	2.1562	19 43 44.6	5.982
10	13 31 31.67	1.9691	13 34 22.9	9.433	10	15 10 29.55	2.1604	19 49 40.7	5.888
11	13 33 29.92	1.9726	13 43 47.2	9.377	11	15 12 39.30	2.1646	19 55 31.1	5.793
12	13 35 28.38	1.9761	13 53 8.2	9.322	12	15 14 49.30	2.1687	20 1 15.9	5.699
13	13 37 27.05	1.9797	14 2 25.9	9.267	13	15 16 59.55	2.1729	20 6 55.0	5.603
14	13 39 25.94	1.9832	14 11 40.2	9.209	14	15 19 10.05	2.1771	20 12 28.3	5.507
15	13 41 25.04	1.9867	14 20 51.0	9.151	15	15 21 20.80	2.1812	20 17 55.8	5.410
16	13 43 24.35	1.9904	14 29 58.3	9.092	16	15 23 31.80	2.1853	20 23 17.5	5.312
17	13 45 23.89	1.9942	14 39 2.1	9.033	17	15 25 43.04	2.1894	20 28 33.2	5.212
18	13 47 23.65	1.9978	14 48 2.3	8.973	18	15 27 54.53	2.1936	20 33 43.0	5.113
19	13 49 23.63	2.0016	14 56 58.9	8.912	19	15 30 6.27	2.1977	20 38 46.8	5.013
20	13 51 23.84	2.0053	15 5 51.8	8.850	20	15 32 18.26	2.2018	20 43 44.6	4.912
21	13 53 24.27	2.0091	15 14 40.9	8.787	21	15 34 30.49	2.2058	20 48 36.3	4.810
22	13 55 24.93	2.0129	15 23 26.3	8.724	22	15 36 42.96	2.2099	20 53 21.8	4.707
23	13 57 25.82	2.0167	15 32 7.8	8.660	23	15 38 55.68	2.2140	20 58 1.2	4.604
24	13 59 26.93	2.0205	S. 15 40 45.5	8.595	24	15 41 8.64	2.2180	S. 21 2 34.3	4.499

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 21.					**FRIDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 41 8.64	2.2180	S.21 2 34.3	4.499	0	17 31 35.51	2.3668	S.22 25 50.7	1.243
1	15 43 21.84	2.2220	21 7 1.1	4.394	1	17 33 57.58	2.3687	22 24 32.2	1.374
2	15 45 35.28	2.2259	21 11 21.6	4.289	2	17 36 19.76	2.3706	22 23 5.8	1.505
3	15 47 48.95	2.2298	21 15 35.8	4.183	3	17 38 42.05	2.3723	22 21 31.6	1.636
4	15 50 2.86	2.2337	21 19 43.6	4.076	4	17 41 4.44	2.3740	22 19 49.5	1.767
5	15 52 17.00	2.2377	21 23 44.9	3.967	5	17 43 26.93	2.3756	22 17 59.5	1.899
6	15 54 31.38	2.2416	21 27 39.7	3.858	6	17 45 49.51	2.3772	22 16 1.6	2.032
7	15 56 45.99	2.2454	21 31 27.9	3.749	7	17 48 12.19	2.3787	22 13 55.7	2.164
8	15 59 0.83	2.2492	21 35 9.6	3.639	8	17 50 34.95	2.3801	22 11 41.9	2.296
9	16 1 15.89	2.2529	21 38 44.6	3.528	9	17 52 57.80	2.3815	22 9 20.2	2.428
10	16 3 31.18	2.2567	21 42 13.0	3.418	10	17 55 20.73	2.3828	22 6 50.5	2.561
11	16 5 46.70	2.2604	21 45 34.8	3.306	11	17 57 43.74	2.3841	22 4 12.9	2.693
12	16 8 2.43	2.2641	21 48 49.8	3.192	12	18 0 6.82	2.3852	22 1 27.3	2.826
13	16 10 18.39	2.2678	21 51 57.9	3.078	13	18 2 29.97	2.3864	21 58 33.8	2.958
14	16 12 34.57	2.2714	21 54 59.2	2.965	14	18 4 53.19	2.3875	21 55 32.3	3.092
15	16 14 50.96	2.2749	21 57 53.7	2.850	15	18 7 16.47	2.3886	21 52 22.8	3.225
16	16 17 7.56	2.2784	22 0 41.2	2.734	16	18 9 39.82	2.3896	21 49 5.3	3.357
17	16 19 24.37	2.2820	22 3 21.8	2.618	17	18 12 3.22	2.3904	21 45 39.9	3.489
18	16 21 41.40	2.2855	22 5 55.4	2.502	18	18 14 26.67	2.3912	21 42 6.6	3.622
19	16 23 58.63	2.2888	22 8 22.0	2.384	19	18 16 50.17	2.3920	21 38 25.2	3.756
20	16 26 16.06	2.2922	22 10 41.5	2.266	20	18 19 13.71	2.3927	21 34 35.9	3.888
21	16 28 33.70	2.2956	22 12 53.9	2.147	21	18 21 37.30	2.3935	21 30 38.6	4.022
22	16 30 51.53	2.2988	22 14 59.2	2.028	22	18 24 0.93	2.3941	21 26 33.3	4.154
23	16 33 9.56	2.3021	S.22 16 57.3	1.909	23	18 26 24.59	2.3946	S.21 22 20.1	4.287
	THURSDAY 22.					**SATURDAY 24.**			
0	16 35 27.78	2.3053	S.22 18 48.3	1.789	0	18 28 48.28	2.3951	S.21 17 58.9	4.419
1	16 37 46.20	2.3085	22 20 32.0	1.667	1	18 31 12.00	2.3956	21 13 29.8	4.551
2	16 40 4.80	2.3116	22 22 8.4	1.547	2	18 33 35.75	2.3960	21 8 52.8	4.683
3	16 42 23.59	2.3147	22 23 37.6	1.425	3	18 35 59.52	2.3962	21 4 7.8	4.816
4	16 44 42.56	2.3177	22 24 59.4	1.302	4	18 38 23.30	2.3965	20 59 14.9	4.947
5	16 47 1.71	2.3207	22 26 13.8	1.178	5	18 40 47.10	2.3968	20 54 14.1	5.078
6	16 49 21.04	2.3236	22 27 20.8	1.055	6	18 43 10.92	2.3970	20 49 5.5	5.209
7	16 51 40.54	2.3264	22 28 20.4	0.931	7	18 45 34.74	2.3971	20 43 49.0	5.341
8	16 54 0.21	2.3292	22 29 12.5	0.806	8	18 47 58.57	2.3972	20 38 24.6	5.472
9	16 56 20.05	2.3320	22 29 57.1	0.681	9	18 50 22.41	2.3973	20 32 52.4	5.602
10	16 58 40.05	2.3347	22 30 34.2	0.556	10	18 52 46.25	2.3972	20 27 12.3	5.733
11	17 1 0.22	2.3374	22 31 3.8	0.430	11	18 55 10.08	2.3972	20 21 24.4	5.862
12	17 3 20.54	2.3400	22 31 25.8	0.303	12	18 57 33.91	2.3971	20 15 28.8	5.992
13	17 5 41.02	2.3426	22 31 40.2	0.177	13	18 59 57.73	2.3969	20 9 25.4	6.121
14	17 8 1.65	2.3450	22 31 47.0	− 0.050	14	19 2 21.54	2.3967	20 3 14.3	6.250
15	17 10 22.42	2.3474	22 31 46.2	+ 0.078	15	19 4 45.34	2.3966	19 56 55.4	6.379
16	17 12 43.34	2.3499	22 31 37.7	0.207	16	19 7 9.13	2.3963	19 50 28.8	6.507
17	17 15 4.41	2.3522	22 31 21.4	0.335	17	19 9 32.89	2.3958	19 43 54.5	6.635
18	17 17 25.61	2.3544	22 30 57.5	0.463	18	19 11 56.63	2.3955	19 37 12.6	6.762
19	17 19 46.94	2.3567	22 30 25.8	0.592	19	19 14 20.35	2.3951	19 30 23.0	6 889
20	17 22 8.41	2.3588	22 29 46.4	0.722	20	19 16 44.04	2.3946	19 23 25.9	7.015
21	17 24 30.00	2.3609	22 28 59.2	0.852	21	19 19 7.70	2.3941	19 16 21.2	7.141
22	17 26 51.72	2.3630	22 28 4.2	0.982	22	19 21 31.33	2.3936	19 9 9.0	7.266
23	17 29 13.56	2.3649	22 27 1.4	1.112	23	19 23 54.93	2.3929	19 1 49.3	7.391
24	17 31 35.51	2.3668	S.22 25 50.7	1.243	24	19 26 18.48	2.3922	S.18 54 22.1	7.516

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 25.					**TUESDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 26 18.48	2.3922	S. 18 54 22.1	7.516	0	21 20 2.38	2.3440	S. 10 44 56.3	12.506
1	19 28 42.00	2.3917	18 46 47.4	7.639	1	21 22 22.99	2.3431	10 32 23.6	12.583
2	19 31 5.49	2.3911	18 39 5.4	7.762	2	21 24 43.55	2.3422	10 19 46.3	12.660
3	19 33 28.93	2.3903	18 31 16.0	7.885	3	21 27 4.05	2.3412	10 7 4.4	12.734
4	19 35 52.33	2.3896	18 23 19.2	8.007	4	21 29 24.49	2.3403	9 54 18.2	12.807
5	19 38 15.68	2.3888	18 15 15.2	8.127	5	21 31 44.89	2.3396	9 41 27.6	12.879
6	19 40 38.99	2.3880	18 7 3.9	8.248	6	21 34 5.24	2.3387	9 28 32.7	12.949
7	19 43 2.24	2.3872	17 58 45.4	8.368	7	21 36 25.53	2.3378	9 15 33.7	13.017
8	19 45 25.45	2.3863	17 50 19.7	8.488	8	21 38 45.78	2.3372	9 2 30.6	13.085
9	19 47 48.60	2.3854	17 41 46.8	8.607	9	21 41 5.99	2.3364	8 49 23.5	13.152
10	19 50 11.70	2.3846	17 33 6.9	8.724	10	21 43 26.15	2.3357	8 36 12.4	13.217
11	19 52 34.75	2.3837	17 24 19.9	8.842	11	21 45 46.27	2.3350	8 22 57.5	13.279
12	19 54 57.74	2.3827	17 15 25.9	8.957	12	21 48 6.35	2.3343	8 9 38.9	13.341
13	19 57 20.67	2.3817	17 6 24.9	9.073	13	21 50 26.39	2.3337	7 56 16.6	13.402
14	19 59 43.55	2.3807	16 57 17.0	9.188	14	21 52 46.39	2.3331	7 42 50.7	13.460
15	20 2 6.36	2.3797	16 48 2.3	9.302	15	21 55 6.36	2.3326	7 29 21.4	13.517
16	20 4 29.11	2.3787	16 38 40.8	9.415	16	21 57 26.30	2.3320	7 15 48.7	13.572
17	20 6 51.80	2.3777	16 29 12.5	9.527	17	21 59 46.20	2.3314	7 2 12.7	13.627
18	20 9 14.43	2.3766	16 19 37.5	9.639	18	22 2 6.07	2.3310	6 48 33.5	13.679
19	20 11 36.99	2.3755	16 9 55.8	9.750	19	22 4 25.92	2.3306	6 34 51.2	13.730
20	20 13 59.49	2.3744	16 0 7.5	9.860	20	22 6 45.74	2.3302	6 21 5.9	13.780
21	20 16 21.92	2.3733	15 50 12.6	9.968	21	22 9 5.54	2.3297	6 7 17.6	13.828
22	20 18 44.29	2.3722	15 40 11.3	10.076	22	22 11 25.31	2.3294	5 53 26.5	13.874
23	20 21 6.59	2.3711	S. 15 30 3.5	10.183	23	22 13 45.07	2.3292	S. 5 39 32.7	13.918
	MONDAY 26.					**WEDNESDAY 28.**			
0	20 23 28.82	2.3699	S. 15 19 49.3	10.289	0	22 16 4.81	2.3288	S. 5 25 36.3	13.962
1	20 25 50.98	2.3688	15 9 28.8	10.394	1	22 18 24.53	2.3287	5 11 37.3	14.003
2	20 28 13.08	2.3677	14 59 2.0	10.498	2	22 20 44.25	2.3285	4 57 35.9	14.042
3	20 30 35.11	2.3666	14 48 29.0	10.601	3	22 23 3.95	2.3283	4 43 32.2	14.081
4	20 32 57.07	2.3655	14 37 49.9	10.702	4	22 25 23.64	2.3282	4 29 26.2	14.118
5	20 35 18.97	2.3644	14 27 4.7	10.804	5	22 27 43.33	2.3281	4 15 18.0	14.153
6	20 37 40.80	2.3632	14 16 13.4	10.904	6	22 30 3.01	2.3280	4 1 7.8	14.186
7	20 40 2.56	2.3621	14 5 16.2	11.002	7	22 32 22.69	2.3280	3 46 55.7	14.217
8	20 42 24.25	2.3609	13 54 13.1	11.101	8	22 34 42.37	2.3281	3 32 41.7	14.248
9	20 44 45.87	2.3598	13 43 4.1	11.198	9	22 37 2.06	2.3282	3 18 25.9	14.277
10	20 47 7.43	2.3587	13 31 49.3	11.293	10	22 39 21.75	2.3282	3 4 8.5	14.303
11	20 49 28.92	2.3576	13 20 28.9	11.387	11	22 41 41.45	2.3283	2 49 49.6	14.327
12	20 51 50.34	2.3564	13 9 2.8	11.481	12	22 44 1.15	2.3285	2 35 29.2	14.351
13	20 54 11.69	2.3553	12 57 31.2	11.573	13	22 46 20.87	2.3288	2 21 7.5	14.372
14	20 56 32.98	2.3542	12 45 54.0	11.665	14	22 48 40.61	2.3291	2 6 44.5	14.392
15	20 58 54.20	2.3532	12 34 11.4	11.754	15	22 51 0.36	2.3293	1 52 20.4	14.410
16	21 1 15.36	2.3522	12 22 23.5	11.842	16	22 53 20.13	2.3297	1 37 55.2	14.426
17	21 3 36.46	2.3511	12 10 30.3	11.930	17	22 55 39.93	2.3302	1 23 29.2	14.441
18	21 5 57.49	2.3500	11 58 31.9	12.016	18	22 57 59.75	2.3305	1 9 2.3	14.454
19	21 8 18.46	2.3489	11 46 28.4	12.101	19	23 0 19.59	2.3310	0 54 34.7	14.465
20	21 10 39.36	2.3478	11 34 19.8	12.185	20	23 2 39.47	2.3316	0 40 6.5	14.474
21	21 13 0.20	2.3468	11 22 6.2	12.267	21	23 4 59.38	2.3321	0 25 37.8	14.482
22	21 15 20.98	2.3459	11 9 47.7	12.348	22	23 7 19.32	2.3327	S. 0 11 8.7	14.487
23	21 17 41.71	2.3450	10 57 24.3	12.427	23	23 9 39.30	2.3332	N. 0 3 20.7	14.492
24	21 20 2.38	2.3440	S. 10 44 56.3	12.506	24	23 11 59.31	2.3339	N. 0 17 50.3	14.494

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	23 11 59.31	2.3339	N. 0 17 50.3	14.494
1	23 14 19.37	2.3347	0 32 20.0	14.494
2	23 16 39.47	2.3354	0 46 49.6	14.492
3	23 18 59.62	2.3362	1 1 19.1	14.489
4	23 21 19.81	2.3370	1 15 48.3	14.484
5	23 23 40.06	2.3379	1 30 17.2	14.478
6	23 26 0.36	2.3388	1 44 45.7	14.470
7	23 28 20.72	2.3397	1 59 13.6	14.459
8	23 30 41.13	2.3407	2 13 40.8	14.447
9	23 33 1.60	2.3417	2 28 7.3	14.434
10	23 35 22.14	2.3428	2 42 32.9	14.418
11	23 37 42.74	2.3438	2 56 57.5	14.400
12	23 40 3.40	2.3449	3 11 20.9	14.381
13	23 42 24.13	2.3461	3 25 43.2	14.360
14	23 44 44.93	2.3473	3 40 4.1	14.337
15	23 47 5.81	2.3486	3 54 23.6	14.312
16	23 49 26.76	2.3498	4 8 41.6	14.286
17	23 51 47.79	2.3511	4 22 57.9	14.257
18	23 54 8.89	2.3524	4 37 12.5	14.228
19	23 56 30.08	2.3538	4 51 25.3	14.197
20	23 58 51.35	2.3552	5 5 36.1	14.163
21	0 1 12.70	2.3566	5 19 44.8	14.126
22	0 3 34.14	2.3581	5 33 51.4	14.090
23	0 5 55.67	2.3595	N. 5 47 55.6	14.051

FRIDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	0 8 17.28	2.3610	N. 6 1 57.5	14.011
1	0 10 38.99	2.3626	6 15 56.9	13.967
2	0 13 0.79	2.3642	6 29 53.6	13.923
3	0 15 22.69	2.3657	6 43 47.7	13.878
4	0 17 44.68	2.3673	6 57 39.0	13.830
5	0 20 6.77	2.3689	7 11 27.3	13.780
6	0 22 28.95	2.3706	7 25 12.6	13.728
7	0 24 51.24	2.3724	7 38 54.7	13.676
8	0 27 13.64	2.3741	7 52 33.7	13.622
9	0 29 36.13	2.3757	8 6 9.3	13.565
10	0 31 58.73	2.3775	8 19 41.5	13.507
11	0 34 21.43	2.3792	8 33 10.1	13.447
12	0 36 44.24	2.3811	8 46 35.1	13.385
13	0 39 7.16	2.3829	8 59 56.3	13.322
14	0 41 30.19	2.3847	9 13 13.7	13.257
15	0 43 53.32	2.3865	9 26 27.2	13.191
16	0 46 16.57	2.3884	9 39 36.6	13.122
17	0 48 39.93	2.3902	9 52 41.8	13.052
18	0 51 3.40	2.3921	10 5 42.8	12.981
19	0 53 26.98	2.3940	10 18 39.5	12.907
20	0 55 50.68	2.3959	10 31 31.7	12.833
21	0 58 14.49	2.3978	10 44 19.4	12.757
22	1 0 38.42	2.3997	10 57 2.5	12.678
23	1 3 2.46	2.4016	11 9 40.8	12.599
24	1 5 26.61	2.4035	N. 11 22 14.4	12.518

SATURDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	1 5 26.61	2.4035	N. 11 22 14.4	12.518
1	1 7 50.88	2.4054	11 34 43.0	12.435
2	1 10 15.26	2.4073	11 47 6.7	12.351
3	1 12 39.76	2.4092	11 59 25.2	12.265
4	1 15 4.37	2.4111	12 11 38.5	12.177
5	1 17 29.09	2.4130	12 23 46.5	12.089
6	1 19 53.93	2.4149	12 35 49.2	11.999
7	1 22 18.88	2.4168	12 47 46.4	11.907
8	1 24 43.95	2.4187	12 59 38.1	11.814
9	1 27 9.13	2.4207	13 11 24.1	11.720
10	1 29 34.43	2.4225	13 23 4.5	11.624
11	1 31 59.83	2.4243	13 34 39.0	11.526
12	1 34 25.34	2.4262	13 46 7.6	11.427
13	1 36 50.97	2.4280	13 57 30.3	11.327
14	1 39 16.70	2.4297	14 8 46.9	11.225
15	1 41 42.54	2.4316	14 19 57.3	11.122
16	1 44 8.49	2.4333	14 31 1.6	11.019
17	1 46 34.54	2.4351	14 41 59.6	10.913
18	1 49 0.70	2.4368	14 52 51.2	10.807
19	1 51 26.96	2.4385	15 3 36.4	10.698
20	1 53 53.32	2.4402	15 14 15.0	10.589
21	1 56 19.78	2.4418	15 24 47.1	10.480
22	1 58 46.34	2.4435	15 35 12.6	10.368
23	2 1 13.00	2.4451	N. 15 45 31.3	10.254

SUNDAY, APRIL 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	2 3 39.75	2.4467	N. 15 55 43.1	10.140

PHASES OF THE MOON.

			d	h	m
☽	First Quarter . .	March	7	17	34.4
○	Full Moon		15	20	11.8
☾	Last Quarter		23	17	36.5
●	New Moon		30	8	30.5

			d	h
☾	Perigee	March	1	0.1
☾	Apogee		14	13.2
☾	Perigee		29	11.3

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
2	Sun	W.	15 28 19	2497	17 9 37	2464	18 51 41	2443	20 34 14	2430
	Aldebaran	E.	72 52 40	2008	70 59 18	2016	69 6 8	2025	67 13 12	2034
	Pollux	E.	114 45 50	2053	112 53 39	2059	111 1 37	2065	109 9 44	2072
3	Sun	W.	29 9 28	2426	30 52 28	2433	32 35 16	2443	34 17 49	2455
	Aldebaran	E.	57 52 36	2093	56 1 26	2107	54 10 38	2122	52 20 13	2138
	Pollux	E.	99 53 30	2120	98 3 2	2133	96 12 53	2146	94 23 4	2159
4	Sun	W.	42 46 24	2520	44 27 10	2535	46 7 35	2551	47 47 37	2568
	Aldebaran	E.	43 14 25	2227	41 26 38	2248	39 39 22	2270	37 52 38	2292
	Pollux	E.	85 19 19	2235	83 31 44	2252	81 44 34	2269	79 57 49	2287
	Regulus	E.	122 12 58	2198	120 24 28	2214	118 36 21	2229	116 48 37	2246
5	Sun	W.	56 1 53	2657	57 39 30	2676	59 16 42	2695	60 53 28	2715
	Venus	W.	16 49 47	2795	18 24 21	2799	19 58 50	2806	21 33 10	2816
	Pollux	E.	71 10 49	2382	69 26 48	2402	67 43 16	2422	66 0 12	2443
	Regulus	E.	107 56 12	2332	106 10 59	2350	104 26 13	2368	102 41 53	2387
6	Sun	W.	68 50 52	2812	70 25 4	2832	71 58 50	2852	73 32 11	2870
	Venus	W.	29 20 49	2889	30 53 22	2906	32 25 33	2924	33 57 22	2940
	Pollux	E.	57 32 19	2549	55 52 14	2572	54 12 40	2593	52 33 36	2617
	Regulus	E.	94 6 46	2479	92 25 3	2497	90 43 46	2516	89 2 55	2534
7	Sun	W.	81 12 48	2966	82 43 43	2985	84 14 15	3003	85 44 24	3021
	Venus	W.	41 30 58	3029	43 0 35	3047	44 29 49	3065	45 58 42	3081
	a Arietis	W.	32 36 12	2706	34 12 44	2715	35 49 4	2725	37 25 10	2736
	Pollux	E.	44 26 13	2736	42 50 21	2763	41 15 4	2789	39 40 22	2816
	Regulus	E.	80 44 56	2624	79 6 33	2641	77 28 35	2658	75 50 59	2675
8	Sun	W.	93 9 42	3107	94 37 43	3124	96 5 24	3140	97 32 45	3155
	Venus	W.	53 17 57	3165	54 44 48	3181	56 11 20	3196	57 37 34	3211
	a Arietis	W.	45 22 1	2794	46 56 37	2806	48 30 57	2818	50 5 1	2830
	Regulus	E.	67 48 37	2757	66 13 13	2773	64 38 10	2788	63 3 26	2803
9	Sun	W.	104 44 59	3229	106 10 34	3242	107 35 53	3255	109 0 57	3268
	Venus	W.	64 44 20	3282	66 8 52	3296	67 33 8	3308	68 57 10	3320
	a Arietis	W.	57 51 32	2887	59 24 7	2898	60 56 28	2909	62 28 35	2920
	Aldebaran	W.	25 6 2	2977	26 36 43	2977	28 7 25	2978	29 38 5	2980
	Regulus	E.	55 14 35	2874	53 41 43	2887	52 9 8	2901	50 36 50	2913
	Spica	E.	109 8 26	2849	107 35 2	2862	106 1 54	2873	104 29 1	2884
10	Sun	W.	116 2 41	3326	117 26 22	3338	118 49 50	3348	120 13 6	3358
	Venus	W.	75 53 55	3376	77 16 39	3386	78 39 11	3396	80 1 32	3405
	a Arietis	W.	70 5 57	2968	71 36 50	2977	73 7 32	2985	74 38 3	2993
	Aldebaran	W.	37 10 32	2999	38 40 46	3004	40 10 54	3009	41 40 55	3014
	Regulus	E.	42 59 20	2975	41 28 36	2986	39 58 6	2998	38 27 52	3010
	Spica	E.	96 48 6	2937	95 16 34	2946	93 45 13	2955	92 14 4	2963
11	Sun	W.	127 6 45	3402	128 28 59	3411	129 51 3	3419	131 12 58	3426
	Venus	W.	86 50 51	3446	88 12 16	3452	89 33 33	3459	90 54 43	3465
	a Arietis	W.	82 8 14	3030	83 37 50	3036	85 7 18	3043	86 36 38	3050
	Aldebaran	W.	49 9 22	3040	50 38 45	3046	52 8 1	3050	53 37 12	3054

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
2	Sun	W.	22 17 6	2423	24 0 8	2419	25 43 15	2419	27 26 22	2422
	Aldebaran	E.	65 20 31	2044	63 28 6	2055	61 35 57	2067	59 44 7	2079
	Pollux	E.	107 18 2	2080	105 26 32	2089	103 35 16	2099	101 44 15	2109
3	Sun	W.	36 0 6	2466	37 42 7	2478	39 23 51	2491	41 5 17	2504
	Aldebaran	E.	50 30 12	2155	48 40 36	2171	46 51 25	2189	45 2 41	2208
	Pollux	E.	92 33 35	2173	90 44 27	2188	88 55 42	2203	87 7 19	2218
4	Sun	W.	49 27 16	2585	51 6 32	2602	52 45 24	2621	54 23 51	2639
	Aldebaran	E.	36 6 27	2316	34 20 51	2340	32 35 50	2366	30 51 26	2392
	Pollux	E.	78 11 31	2306	76 25 40	2324	74 40 15	2343	72 55 18	2362
	Regulus	E.	115 1 18	2263	113 14 24	2280	111 27 55	2297	109 41 51	2314
5	Sun	W.	62 29 48	2735	64 5 42	2753	65 41 11	2773	67 16 14	2792
	Venus	W.	23 7 17	2828	24 41 9	2842	26 14 42	2857	27 47 56	2873
	Pollux	E.	64 17 38	2464	62 35 34	2485	60 53 59	2506	59 12 54	2527
	Regulus	E.	100 57 59	2405	99 14 31	2424	97 31 30	2442	95 48 55	2460
6	Sun	W.	75 5 8	2891	76 37 39	2909	78 9 46	2928	79 41 29	2947
	Venus	W.	35 28 50	2958	36 59 56	2976	38 30 39	2994	40 0 59	3011
	Pollux	E.	50 55 4	2640	49 17 4	2663	47 39 35	2687	46 2 38	2711
	Regulus	E.	87 22 29	2552	85 42 28	2571	84 2 53	2589	82 23 43	2606
7	Sun	W.	87 14 11	3039	88 43 35	3056	90 12 38	3073	91 41 20	3091
	Venus	W.	47 27 15	3099	48 55 26	3116	50 23 16	3133	51 50 46	3148
	a Arietis	W.	39 1 2	2747	40 36 39	2758	42 12 2	2770	43 47 9	2782
	Pollux	E.	38 6 15	2845	36 32 45	2875	34 59 54	2906	33 27 43	2939
	Regulus	E.	74 13 46	2692	72 36 56	2709	71 0 28	2725	69 24 22	2741
8	Sun	W.	98 59 48	3171	100 26 32	3186	101 52 59	3200	103 19 8	3215
	Venus	W.	59 3 30	3226	60 29 8	3242	61 54 28	3255	63 19 32	3269
	a Arietis	W.	51 38 50	2842	53 12 24	2854	54 45 42	2866	56 18 44	2877
	Regulus	E.	61 29 2	2818	59 54 57	2833	58 21 12	2847	56 47 45	2860
9	Sun	W.	110 25 46	3281	111 50 20	3293	113 14 40	3304	114 38 47	3315
	Venus	W.	70 20 58	3332	71 44 32	3345	73 7 52	3356	74 30 59	3365
	a Arietis	W.	64 0 28	2930	65 32 9	2940	67 3 37	2950	68 34 53	2959
	Aldebaran	W.	31 8 43	2982	32 39 18	2986	34 9 48	2990	35 40 13	2995
	Regulus	E.	49 4 48	2927	47 33 3	2939	46 1 33	2951	44 30 19	2963
	Spica	E.	102 56 22	2896	101 23 58	2907	99 51 48	2917	98 19 51	2927
10	Sun	W.	121 36 11	3367	122 59 5	3377	124 21 48	3386	125 44 21	3393
	Venus	W.	81 23 43	3414	82 45 44	3423	84 7 35	3431	85 29 17	3438
	a Arietis	W.	76 8 24	3001	77 38 35	3009	79 8 37	3016	80 38 30	3023
	Aldebaran	W.	43 10 50	3020	44 40 38	3026	46 10 19	3031	47 39 53	3035
	Regulus	E.	36 57 52	3022	35 28 6	3034	33 58 35	3047	32 29 21	3059
	Spica	E.	90 43 5	2972	89 12 17	2980	87 41 39	2987	86 11 10	2994
11	Sun	W.	132 34 45	3432	133 56 25	3440	135 17 56	3447	136 39 20	3454
	Venus	W.	92 15 46	3471	93 36 43	3476	94 57 33	3481	96 18 18	3487
	a Arietis	W.	88 5 52	3053	89 34 59	3059	91 3 59	3064	92 32 53	3068
	Aldebaran	W.	55 6 18	3059	56 35 18	3062	58 4 14	3066	59 33 5	3069

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
11	Spica	E.	84 40 50	3001	83 10 39	3008	81 40 36	3014	80 10 41	3020
	JUPITER	E.	132 45 18	3019	131 15 29	3025	129 45 47	3031	128 16 13	3037
12	VENUS	W.	97 38 57	3491	98 59 31	3496	100 20 0	3499	101 40 25	3502
	a Arietis	W.	94 1 42	3073	95 30 25	3077	96 59 3	3080	98 27 37	3084
	Aldebaran	W.	61 1 52	3073	62 30 35	3077	63 59 13	3079	65 27 48	3082
	Pollux	W.	20 46 21	3552	22 5 48	3497	23 26 16	3451	24 47 35	3412
	Spica	E.	72 42 45	3045	71 13 28	3048	69 44 15	3052	68 15 7	3056
	JUPITER	E.	120 50 0	3060	119 21 2	3065	117 52 9	3068	116 23 20	3070
13	VENUS	W.	108 21 39	3516	109 41 45	3518	111 1 49	3519	112 21 52	3521
	Aldebaran	W.	72 50 0	3091	74 18 20	3093	75 46 37	3095	77 14 53	3096
	Pollux	W.	31 43 17	3289	33 7 41	3274	34 32 23	3261	35 57 20	3249
	Spica	E.	60 50 24	3069	59 21 37	3072	57 52 53	3073	56 24 10	3074
	Antares	E.	106 19 55	3078	104 51 18	3079	103 22 43	3080	101 54 9	3082
	JUPITER	E.	109 0 8	3083	107 31 38	3085	106 3 10	3086	104 34 43	3087
	SATURN	E.	132 35 41	3085	131 7 13	3087	129 38 48	3088	128 10 24	3090
14	VENUS	W.	119 1 47	3525	120 21 44	3524	121 41 42	3524	123 1 40	3524
	Aldebaran	W.	84 35 56	3099	86 4 7	3098	87 32 19	3098	89 0 31	3098
	Pollux	W.	43 5 6	3206	44 31 8	3199	45 57 18	3193	47 23 36	3188
	Spica	E.	49 0 58	3079	47 32 23	3079	46 3 48	3079	44 35 13	3079
	JUPITER	E.	97 12 51	3091	95 44 30	3091	94 16 9	3090	92 47 47	3090
	SATURN	E.	120 48 43	3092	119 20 25	3092	117 52 6	3093	116 23 47	3092
15	Aldebaran	W.	96 21 38	3094	97 49 55	3093	99 18 13	3091	100 46 33	3090
	Pollux	W.	54 36 38	3163	56 3 32	3158	57 30 31	3153	58 57 36	3149
	Spica	E.	37 12 13	3077	35 43 35	3077	34 14 57	3075	32 46 17	3073
	Antares	E.	82 43 46	3081	81 15 13	3080	79 46 39	3078	78 18 3	3076
	JUPITER	E.	85 25 47	3085	83 57 19	3084	82 28 50	3082	81 0 18	3080
	SATURN	E.	109 2 4	3087	107 33 39	3087	106 5 13	3085	104 36 45	3082
16	Pollux	W.	66 14 15	3129	67 41 50	3124	69 9 30	3120	70 37 15	3116
	Regulus	W.	29 11 54	3129	30 39 28	3121	32 7 12	3112	33 35 7	3105
	Antares	E.	70 54 28	3067	69 25 38	3065	67 56 45	3062	66 27 49	3059
	JUPITER	E.	73 37 2	3069	72 8 14	3066	70 39 23	3063	69 10 27	3060
	SATURN	E.	97 13 47	3072	95 45 3	3069	94 16 16	3066	92 47 25	3063
	a Aquilæ	E.	121 8 8	3687	119 51 7	3665	118 33 43	3646	117 15 58	3626
17	Pollux	W.	77 57 17	3095	79 25 33	3090	80 53 55	3085	82 22 23	3081
	Regulus	W.	40 56 52	3071	42 25 37	3065	43 54 29	3059	45 23 29	3053
	Antares	E.	59 2 15	3044	57 32 57	3041	56 3 35	3037	54 34 8	3034
	JUPITER	E.	61 44 51	3043	60 15 31	3039	58 46 6	3034	57 16 35	3030
	SATURN	E.	85 22 11	3046	83 52 55	3042	82 23 34	3038	80 54 8	3034
	a Aquilæ	E.	110 42 27	3547	109 22 55	3534	108 3 8	3521	106 43 7	3509
18	Pollux	W.	89 46 6	3057	91 15 8	3052	92 44 17	3046	94 13 33	3040
	Regulus	W.	52 50 21	3022	54 20 6	3017	55 49 58	3009	57 19 59	3003
	Antares	E.	47 5 47	3014	45 35 52	3011	44 5 53	3006	42 35 48	3001
	JUPITER	E.	49 47 37	3005	48 17 31	3001	46 47 19	2995	45 17 0	2989
	SATURN	E.	73 25 35	3009	71 55 34	3004	70 25 26	2998	68 55 11	2993
	a Aquilæ	E.	99 59 54	3457	98 38 42	3447	97 17 19	3438	95 55 46	3431

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
11	Spica	E.	78 40 53	3026	77 11 12	3030	75 41 37	3035	74 12 8	3040
	JUPITER	E.	126 46 46	3043	125 17 26	3047	123 48 12	3052	122 19 3	3056
12	VENUS	W.	103 0 47	3506	104 21 5	3509	105 41 19	3512	107 1 30	3514
	α Arietis	W.	99 56 6	3088	101 24 30	3091	102 52 50	3094	104 21 7	3096
	Aldebaran	W.	66 56 20	3084	68 24 49	3087	69 53 15	3089	71 21 38	3090
	Pollux	W.	26 9 38	3378	27 32 20	3350	28 55 34	3327	30 19 14	3307
	Spica	E.	66 46 3	3059	65 17 3	3062	63 48 7	3065	62 19 14	3067
	JUPITER	E.	114 54 34	3074	113 25 53	3077	111 57 15	3079	110 28 40	3082
13	VENUS	W.	113 41 53	3522	115 1 53	3524	116 21 51	3524	117 41 49	3524
	Aldebaran	W.	78 43 7	3097	80 11 20	3097	81 39 33	3098	83 7 45	3099
	Pollux	W.	37 22 31	3239	38 47 54	3230	40 13 28	3221	41 39 12	3213
	Spica	E.	54 55 29	3076	53 26 50	3077	51 58 12	3078	50 29 35	3078
	Antares	E.	100 25 37	3082	98 57 6	3083	97 28 36	3084	96 0 7	3084
	JUPITER	E.	103 6 18	3089	101 37 55	3090	100 9 33	3091	98 41 12	3091
	SATURN	E.	126 42 2	3091	125 13 41	3091	123 45 21	3092	122 17 2	3092
14	VENUS	W.	124 21 38	3523	125 41 37	3522	127 1 37	3521	128 21 38	3519
	Aldebaran	W.	90 28 43	3097	91 56 56	3097	93 25 9	3096	94 53 23	3096
	Pollux	W.	48 50 0	3182	50 16 31	3178	51 43 7	3172	53 9 50	3168
	Spica	E.	43 6 38	3079	41 38 3	3078	40 9 27	3078	38 40 50	3078
	JUPITER	E.	91 19 25	3089	89 51 2	3088	88 22 39	3087	86 54 14	3086
	SATURN	E.	114 55 28	3091	113 27 8	3091	111 58 48	3091	110 30 27	3089
15	Aldebaran	W.	102 14 55	3089	103 43 18	3087	105 11 44	3085	106 40 12	3083
	Pollux	W.	60 24 46	3145	61 52 1	3142	63 19 20	3137	64 46 45	3133
	Spica	E.	31 17 35	3073	29 48 52	3072	28 20 8	3070	26 51 22	3069
	Antares	E.	76 49 24	3075	75 20 44	3073	73 52 1	3071	72 23 16	3069
	JUPITER	E.	79 31 44	3078	78 3 7	3076	76 34 28	3074	75 5 46	3072
	SATURN	E.	103 8 14	3081	101 39 41	3079	100 11 6	3077	98 42 28	3074
16	Pollux	W.	72 5 5	3112	73 33 0	3108	75 1 0	3103	76 29 6	3099
	Regulus	W.	35 3 11	3097	36 31 24	3091	37 59 45	3084	39 28 15	3078
	Antares	E.	64 58 49	3056	63 29 46	3053	62 0 40	3050	60 31 29	3047
	JUPITER	E.	67 41 28	3056	66 12 25	3053	64 43 18	3050	63 14 7	3046
	SATURN	E.	91 18 30	3060	89 49 32	3056	88 20 29	3053	86 51 22	3050
	α Aquilæ	E.	115 57 52	3609	114 39 27	3592	113 20 44	3576	112 1 44	3561
17	Pollux	W.	83 50 56	3076	85 19 35	3072	86 48 19	3067	88 17 9	3062
	Regulus	W.	46 52 36	3047	48 21 51	3041	49 51 13	3034	51 20 43	3028
	Antares	E.	53 4 37	3030	51 35 2	3026	50 5 22	3022	48 35 37	3018
	JUPITER	E.	55 46 59	3025	54 17 17	3021	52 47 30	3016	51 17 37	3010
	SATURN	E.	79 24 37	3029	77 55 0	3025	76 25 18	3020	74 55 30	3014
	α Aquilæ	E.	105 22 53	3497	104 2 26	3487	102 41 47	3476	101 20 56	3466
18	Pollux	W.	95 42 55	3035	97 12 24	3030	98 41 59	3025	100 11 41	3019
	Regulus	W.	58 50 8	2997	60 20 25	2990	61 50 50	2983	63 21 24	2976
	Antares	E.	41 5 37	2998	39 35 22	2993	38 5 1	2989	36 34 35	2985
	JUPITER	E.	43 46 34	2984	42 16 1	2977	40 45 20	2971	39 14 31	2965
	SATURN	E.	67 24 50	2988	65 54 22	2981	64 23 46	2975	62 53 2	2969
	α Aquilæ	E.	94 34 4	3423	93 12 14	3415	91 50 15	3409	90 28 9	3402

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
19	Pollux	W.	101 41 31	3013	103 11 28	3007	104 41 32	3001	106 11 44	2995
	Regulus	W.	64 52 7	2969	66 22 58	2962	67 53 58	2954	69 25 8	2946
	JUPITER	E.	37 43 34	2958	36 12 29	2952	34 41 16	2945	33 9 54	2937
	SATURN	E.	61 22 10	2962	59 51 10	2955	58 20 1	2948	56 48 43	2940
	a Aquilæ	E.	89 5 55	3396	87 43 34	3390	86 21 6	3385	84 58 32	3379
20	Regulus	W.	77 3 28	2905	78 35 40	2898	80 8 2	2888	81 40 36	2878
	Spica	W.	23 0 14	2901	24 32 32	2891	26 5 3	2880	27 37 48	2870
	SATURN	E.	49 9 48	2901	47 37 30	2893	46 5 2	2883	44 32 22	2874
	a Aquilæ	E.	78 4 21	3359	76 41 18	3358	75 18 13	3355	73 55 5	3353
	MARS	E.	119 50 43	3206	118 24 41	3195	116 58 26	3185	115 31 59	3174
21	Regulus	W.	89 26 31	2829	91 0 21	2818	92 34 25	2808	94 8 43	2797
	Spica	W.	35 24 48	2818	36 58 53	2806	38 33 13	2795	40 7 47	2783
	SATURN	E.	36 45 59	2825	35 12 4	2815	33 37 55	2804	32 3 32	2792
	a Aquilæ	E.	66 59 15	3357	65 36 9	3360	64 13 6	3364	62 50 8	3369
	MARS	E.	108 16 31	3119	106 48 45	3107	105 20 44	3095	103 52 29	3083
	SUN	E.	122 32 6	3191	121 5 46	3178	119 39 11	3167	118 12 22	3153
22	Spica	W.	48 4 33	2722	49 40 43	2710	51 17 10	2696	52 53 55	2684
	a Aquilæ	E.	55 57 23	3420	54 35 29	3435	53 13 52	3454	51 52 36	3473
	MARS	E.	96 27 23	3018	94 57 33	3005	93 27 27	2991	91 57 3	2977
	SUN	E.	110 54 17	3087	109 25 51	3072	107 57 7	3058	106 28 6	3043
23	Spica	W.	61 2 12	2613	62 40 49	2599	64 19 46	2584	65 59 3	2569
	a Aquilæ	E.	45 13 32	3642	43 55 43	3692	42 38 47	3748	41 22 51	3814
	MARS	E.	84 20 33	2904	82 48 19	2888	81 15 45	2873	79 42 51	2857
	SUN	E.	98 58 25	2966	97 27 30	2951	95 56 16	2935	94 24 41	2919
24	Spica	W.	74 20 43	2492	76 2 8	2476	77 43 55	2460	79 26 5	2444
	JUPITER	W.	25 52 27	2497	27 33 45	2481	29 15 25	2464	30 57 29	2448
	MARS	E.	71 53 15	2777	70 18 17	2762	68 42 59	2745	67 7 19	2728
	SUN	E.	86 41 35	2835	85 7 53	2818	83 33 49	2801	81 59 23	2785
25	Spica	W.	88 2 34	2364	89 47 1	2348	91 31 51	2332	93 17 4	2315
	JUPITER	W.	39 33 38	2366	41 18 2	2349	43 2 50	2333	44 48 1	2317
	SATURN	W.	15 47 33	2375	17 31 44	2359	19 16 17	2344	21 1 13	2327
	MARS	E.	59 3 30	2648	57 25 40	2632	55 47 29	2616	54 8 56	2601
	SUN	E.	74 1 34	2698	72 24 51	2681	70 47 46	2665	69 10 19	2648
26	JUPITER	W.	53 39 48	2238	55 27 19	2223	57 15 12	2208	59 3 28	2194
	SATURN	W.	29 51 54	2247	31 39 12	2231	33 26 53	2216	35 14 57	2202
	MARS	E.	45 51 4	2530	44 10 32	2517	42 29 42	2504	40 48 34	2493
	SUN	E.	60 57 20	2566	59 17 39	2551	57 37 36	2535	55 57 12	2520
27	JUPITER	W.	68 10 5	2125	70 0 26	2113	71 51 5	2101	73 42 3	2090
	SATURN	W.	44 20 33	2134	46 10 41	2122	48 1 7	2110	49 51 52	2098
	SUN	E.	47 30 13	2454	45 47 55	2442	44 5 19	2431	42 22 28	2421
28	JUPITER	W.	83 1 0	2041	84 53 31	2032	86 46 15	2025	88 39 11	2017
	SATURN	W.	59 9 46	2048	61 2 5	2041	62 54 36	2033	64 47 19	2026
	SUN	E.	33 44 59	2383	32 1 0	2380	30 16 57	2378	28 32 50	2378

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV$^{\mathrm{h}}$.	P. L. of Diff.	XVIII$^{\mathrm{h}}$.	P. L. of Diff.	XXI$^{\mathrm{h}}$.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
19	Pollux	W.	107 42 3	2989	109 12 30	2982	110 43 5	2975	112 13 48	2967
	Regulus	W.	70 56 28	2939	72 27 57	2931	73 59 37	2923	75 31 27	2914
	JUPITER	E.	31 38 22	2930	30 6 41	2924	28 34 52	2916	27 2 52	2907
	SATURN	E.	55 17 15	2933	53 45 38	2926	52 13 52	2917	50 41 55	2909
	a Aquilæ	E.	83 35 52	3374	82 13 6	3370	80 50 16	3366	79 27 21	3362
20	Regulus	W.	83 13 23	2869	84 46 22	2860	86 19 32	2850	87 52 55	2840
	Spica	W.	29 10 45	2860	30 43 55	2849	32 17 19	2838	33 50 57	2828
	SATURN	E.	42 59 30	2865	41 26 26	2855	39 53 10	2845	38 19 41	2835
	a Aquilæ	E.	72 31 55	3353	71 8 45	3352	69 45 34	3353	68 22 24	3354
	MARS	E.	114 5 19	3164	112 38 27	3153	111 11 22	3142	109 44 3	3131
21	Regulus	W.	95 43 15	2785	97 18 2	2775	98 53 3	2763	100 28 20	2750
	Spica	W.	41 42 37	2772	43 17 42	2760	44 53 3	2747	46 28 40	2735
	SATURN	E.	30 28 54	2781	28 54 1	2769	27 18 53	2757	25 43 29	2746
	a Aquilæ	E.	61 27 16	3376	60 4 32	3384	58 41 57	3394	57 19 33	3406
	MARS	E.	102 23 59	3071	100 55 14	3058	99 26 13	3045	97 56 56	3032
	SUN	E.	116 45 17	3140	115 17 56	3127	113 50 19	3114	112 22 26	3101
22	Spica	W.	54 30 57	2670	56 8 17	2656	57 45 56	2642	59 23 54	2627
	a Aquilæ	E.	50 31 43	3500	49 11 19	3528	47 51 26	3560	46 32 8	3598
	MARS	E.	90 26 22	2963	88 55 23	2948	87 24 5	2933	85 52 28	2919
	SUN	E.	104 58 47	3028	103 29 8	3014	101 59 13	2999	100 28 59	2983
23	Spica	W.	67 38 41	2554	69 18 39	2538	70 58 59	2523	72 39 40	2507
	a Aquilæ	E.	40 8 3	3889	38 54 32	3976	37 42 29	4074	36 32 2	4194
	MARS	E.	78 9 37	2842	76 36 3	2825	75 2 8	2809	73 27 52	2793
	SUN	E.	92 52 46	2903	91 20 31	2886	89 47 54	2869	88 14 55	2852
24	Spica	W.	81 8 37	2429	82 51 31	2412	84 34 49	2396	86 18 30	2380
	JUPITER	W.	32 39 56	2431	34 22 46	2415	36 6 0	2398	37 49 37	2382
	MARS	E.	65 31 16	2712	63 54 52	2696	62 18 7	2680	60 41 0	2663
	SUN	E.	80 24 35	2767	78 49 24	2750	77 13 50	2732	75 37 53	2716
25	Spica	W.	95 2 41	2300	96 48 40	2285	98 35 2	2268	100 21 48	2253
	JUPITER	W.	46 33 36	2301	48 19 34	2285	50 5 55	2269	51 52 40	2253
	SATURN	W.	22 46 33	2311	24 32 17	2294	26 18 26	2278	28 4 58	2262
	MARS	E.	52 30 2	2586	50 50 48	2571	49 11 13	2556	47 31 18	2543
	SUN	E.	67 32 29	2630	65 54 15	2613	64 15 38	2598	62 36 40	2582
26	JUPITER	W.	60 52 5	2179	62 41 4	2166	64 30 23	2151	66 20 4	2138
	SATURN	W.	37 3 22	2187	38 52 9	2174	40 41 16	2160	42 30 44	2146
	MARS	E.	39 7 11	2482	37 25 33	2473	35 43 42	2465	34 1 39	2457
	SUN	E.	54 16 27	2506	52 35 22	2492	50 53 57	2479	49 12 13	2467
27	JUPITER	W.	75 33 18	2078	77 24 50	2068	79 16 38	2058	81 8 42	2049
	SATURN	W.	51 42 55	2087	53 34 14	2076	55 25 50	2066	57 17 41	2057
	SUN	E.	40 39 23	2411	38 56 4	2403	37 12 33	2395	35 28 51	2388
28	JUPITER	W.	90 32 18	2012	92 25 34	2007	94 18 58	2001	96 12 30	1997
	SATURN	W.	66 40 12	2020	68 33 15	2015	70 26 26	2010	72 19 45	2006
	SUN	E.	26 48 43	2379	25 4 38	2382	23 20 38	2390	21 36 49	2403

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	0 41 36.01	9.105	N. 4 28 40.7	+57.90	16 1.03	64.42	4 1.98	0.752
Mon.	2	0 45 14.52	9.109	4 51 47.8	57.69	16 0.75	64.44	3 43.99	0.748
Tues.	3	0 48 53.15	9.114	5 14 49.6	57.47	16 0.48	64.46	3 26.10	0.743
Wed.	4	0 52 31.91	9.120	5 37 45.7	+57.23	16 0.20	64.48	3 8.36	0.737
Thur.	5	0 56 10.82	9.126	6 0 35.9	56.97	15 59.93	64.51	2 50.77	0.731
Frid.	6	0 59 49.89	9.133	6 23 19.7	56.70	15 59.65	64.54	2 33.32	0.724
Sat.	7	1 3 29.13	9.141	6 45 56.8	+56.41	15 59.37	64.57	2 16.06	0.716
SUN.	8	1 7 8.57	9.150	7 8 26.9	56.11	15 59.10	64.60	1 59.00	0.707
Mon.	9	1 10 48.23	9.160	7 30 49.8	55.80	15 58.82	64.64	1 42.15	0.697
Tues.	10	1 14 28.14	9.170	7 53 5.0	+55.48	15 58.55	64.68	1 25.56	0.687
Wed.	11	1 18 8.28	9.181	8 15 12.1	55.15	15 58.28	64.72	1 9.20	0.676
Thur.	12	1 21 48.71	9.193	8 37 11.1	54.80	15 58.01	64.77	0 53.12	0.664
Frid.	13	1 25 29.44	9.206	8 59 1.4	+54.43	15 57.74	64.81	0 37.33	0.651
Sat.	14	1 29 10.48	9.219	9 20 42.7	54.05	15 57.47	64.86	0 21.86	0.638
SUN.	15	1 32 51.85	9.233	9 42 14.8	53.65	15 57.20	64.91	0 6.72	0.624
Mon.	16	1 36 33.58	9.248	10 3 37.3	+53.24	15 56.94	64.96	0 8.07	0.609
Tues.	17	1 40 15.66	9.264	10 24 49.8	52.82	15 56.68	65.01	0 22.50	0.593
Wed.	18	1 43 58.14	9.280	10 45 52.2	52.39	15 56.42	65.07	0 36.53	0.576
Thur.	19	1 47 41.04	9.297	11 6 44.0	+51.94	15 56.16	65.13	0 50.15	0.559
Frid.	20	1 51 24.34	9.315	11 27 25.0	51.48	15 55.90	65.19	1 3.37	0.541
Sat.	21	1 55 8.09	9.334	11 47 54.7	51.01	15 55.64	65.25	1 16.14	0.523
SUN.	22	1 58 52.30	9.353	12 8 12.9	+50.52	15 55.38	65.32	1 28.45	0.504
Mon.	23	2 2 36.96	9.373	12 28 19.2	50.02	15 55.12	65.38	1 40.29	0.484
Tues.	24	2 6 22.13	9.393	12 48 13.4	49.50	15 54.87	65.45	1 51.66	0.464
Wed.	25	2 10 7.77	9.413	13 7 55.1	+48.97	15 54.62	65.52	2 2.54	0.443
Thur.	26	2 13 53.91	9.434	13 27 23.9	48.43	15 54.37	65.59	2 12.93	0.422
Frid.	27	2 17 40.56	9.455	13 46 39.5	47.87	15 54.12	65.66	2 22.80	0.401
Sat.	28	2 21 27.73	9.476	14 5 41.5	+47.29	15 53.87	65.74	2 32.16	0.380
SUN.	29	2 25 15.42	9.498	14 24 29.6	46.70	15 53.63	65.81	2 41.01	0.358
Mon.	30	2 29 3.62	9.520	14 43 3.4	46.10	15 53.39	65.89	2 49.34	0.336
Tues.	31	2 32 52.35	9.542	N. 15 1 22.8	+45.49	15 53.15	65.97	2 57.14	0.314

NOTE.—The mean time of semidiameter passing may be found by subtracting 0.18 from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	0 41 35.40	9.105	N. 4 28 36.8	+57.90	4 2.03	0.752	0 37 33.37
Mon.	2	0 45 13.96	9.109	4 51 44.2	57.69	3 44.04	0.748	0 41 29.93
Tues.	3	0 48 52.63	9.114	5 14 46.3	57.47	3 26.15	0.743	0 45 26.48
Wed.	4	0 52 31.44	9.120	5 37 42.7	+57.23	3 8.40	0.737	0 49 23.03
Thur.	5	0 56 10.39	9.126	6 0 33.2	56.97	2 50.81	0.731	0 53 19.59
Frid.	6	0 59 49.49	9.133	6 23 17.3	56.70	2 33.36	0.724	0 57 16.14
Sat.	7	1 3 28.79	9.141	6 45 54.7	+56.41	2 16.09	0.716	1 1 12.69
SUN.	8	1 7 8.27	9.150	7 8 25.1	56.11	1 59.02	0.707	1 5 9.24
Mon.	9	1 10 47.97	9.160	7 30 48.2	55.80	1 42.17	0.697	1 9 5.80
Tues.	10	1 14 27.91	9.170	7 53 3.7	+55.48	1 25.57	0.687	1 13 2.35
Wed.	11	1 18 8.11	9.181	8 15 11.1	55.15	1 9.21	0.676	1 16 58.90
Thur.	12	1 21 48.58	9.193	8 37 10.3	54.80	0 53.13	0.664	1 20 55.46
Frid.	13	1 25 29.35	9.206	8 59 0.8	+54.43	0 37.34	0.651	1 24 52.01
Sat.	14	1 29 10.43	9.219	9 20 42.4	54.05	0 21.86	0.638	1 28 48.56
SUN.	15	1 32 51.84	9.233	9 42 14.7	53.65	0 6.72	0.624	1 32 45.12
Mon.	16	1 36 33.60	9.248	10 3 37.4	+53.24	0 8.07	0.609	1 36 41.67
Tues.	17	1 40 15.72	9.264	10 24 50.1	52.82	0 22.50	0.593	1 40 38.22
Wed.	18	1 43 58.24	9.280	10 45 52.7	52.39	0 36.54	0.576	1 44 34.78
Thur.	19	1 47 41.17	9.297	11 6 44.7	+51.94	0 50.16	0.559	1 48 31.33
Frid.	20	1 51 24.51	9.315	11 27 25.9	51.48	1 3.38	0.541	1 52 27.88
Sat.	21	1 55 8.29	9.334	11 47 55.8	51.01	1 16.15	0.523	1 56 24.44
SUN.	22	1 58 52.53	9.353	12 8 14.2	+50.52	1 28.46	0.504	2 0 20.99
Mon.	23	2 2 37.24	9.373	12 28 20.7	50.02	1 40.32	0.484	2 4 17.55
Tues.	24	2 6 22.42	9.393	12 48 15.0	49.50	1 51.68	0.464	2 8 14.10
Wed.	25	2 10 8.09	9.413	13 7 56.8	+48.97	2 2.56	0.443	2 12 10.65
Thur.	26	2 13 54.26	9.434	13 27 25.7	48.43	2 12.95	0.422	2 16 7.21
Frid.	27	2 17 40.94	9.455	13 46 41.4	47.87	2 22.82	0.401	2 20 3.76
Sat.	28	2 21 28.13	9.476	14 5 43.5	+47.29	2 32.18	0.380	2 24 0.32
SUN.	29	2 25 15.84	9.498	14 24 31.7	46.70	2 41.03	0.358	2 27 56.87
Mon.	30	2 29 4.07	9.520	14 43 5.6	46.10	2 49.36	0.336	2 31 53.42
Tues.	31	2 32 52.82	9.542	N. 15 1 25.0	+45.49	2 57.16	0.314	2 35 49.98

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour,
+9s.8565.
(Table III.)

AT GREENWICH MEAN NOON.

THE SUN'S

Day of the Month.	Day of the Year.	TRUE LONGITUDE.					Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.		
		λ			λ′								
		°	′	″	′	″	″	″			h	m	s
1	91	11	18	58.8	18	29.9	147.96	+ 0.61	9.9999032	+51.8	23	18	36.87
2	92	12	18	8.6	17	39.7	147.87	0.50	0.0000271	51.5	23	14	40.96
3	93	13	17	16.2	16	47.2	147.77	0.37	0.0001504	51.3	23	10	45.06
4	94	14	16	21.6	15	52.4	147.68	+ 0.25	0.0002731	+51.1	23	6	49.15
5	95	15	15	24.6	14	55.4	147.58	+ 0.11	0.0003954	50.9	23	2	53.24
6	96	16	14	25.3	13	56.0	147.49	− 0.01	0.0005174	50.8	22	58	57.33
7	97	17	13	23.7	12	54.3	147.39	− 0.11	0.0006391	+50.7	22	55	1.43
8	98	18	12	19.8	11	50.3	147.29	0.21	0.0007607	50.6	22	51	5.52
9	99	19	11	13.7	10	44.1	147.20	0.26	0.0008821	50.6	22	47	9.61
10	100	20	10	5.3	9	35.6	147.10	− 0.30	0.0010035	+50.6	22	43	13.71
11	101	21	8	54.7	8	24.9	147.01	0.32	0.0011248	50.6	22	39	17.80
12	102	22	7	41.9	7	12.0	146.92	0.30	0.0012462	50.6	22	35	21.89
13	103	23	6	27.0	5	57.0	146.83	− 0.27	0.0013676	+50.6	22	31	25.98
14	104	24	5	10.1	4	40.0	146.75	0.21	0.0014890	50.6	22	27	30.08
15	105	25	3	51.2	3	21.0	146.67	0.12	0.0016104	50.6	22	23	34.17
16	106	26	2	30.3	2	0.0	146.59	− 0.02	0.0017319	+50.6	22	19	38.26
17	107	27	1	7.5	0	37.1	146.51	+ 0.10	0.0018534	50.6	22	15	42.35
18	108	27	59	43.0	59	12.4	146.44	0.23	0.0019747	50.5	22	11	46.45
19	109	28	58	16.7	57	46.0	146.37	+ 0.36	0.0020958	+50.4	22	7	50.54
20	110	29	56	48.7	56	17.9	146.30	0.48	0.0022166	50.3	22	3	54.63
21	111	30	55	19.0	54	48.2	146.23	0.60	0.0023371	50.1	21	59	58.72
22	112	31	53	47.8	53	16.8	146.16	+ 0.70	0.0024569	+49.8	21	56	2.82
23	113	32	52	14.9	51	43.8	146.10	0.76	0.0025759	49.4	21	52	6.91
24	114	33	50	40.6	50	9.4	146.04	0.80	0.0026941	48.9	21	48	11.00
25	115	34	49	4.6	48	33.3	145.97	+ 0.80	0.0028110	+48.4	21	44	15.09
26	116	35	47	27.1	46	55.6	145.90	0.77	0.0029267	47.8	21	40	19.18
27	117	36	45	47.9	45	16.4	145.83	0.72	0.0030409	47.2	21	36	23.27
28	118	37	44	7.1	43	35.4	145.76	+ 0.63	0.0031536	+46.6	21	32	27.37
29	119	38	42	24.6	41	52.8	145.69	0.52	0.0032646	45.9	21	28	31.46
30	120	39	40	40.2	40	8.3	145.62	0.40	0.0033740	45.2	21	24	35.55
31	121	40	38	54.0	38	22.0	145.54	+ 0.26	0.0034818	+44.5	21	20	39.64

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 26.3	16 19.9	60 13.1	−1.80	59 49.9	−2.03	1 29.5	2.37	1.6
2	16 12.9	16 5.5	59 24.2	2.21	58 56.8	2.33	2 26.9	2.40	2.6
3	15 57.7	15 49.9	58 28.3	2.39	57 59.4	2.40	3 24.3	2.38	3.6
4	15 42.1	15 34.5	57 30.8	−2.35	57 2.9	−2.28	4 20.7	2.31	4.6
5	15 27.2	15 20.3	56 36.2	2.16	56 11.0	2.01	5 14.9	2.20	5.6
6	15 14.0	15 8.2	55 47.8	1.85	55 26.6	1.67	6 6.2	2.07	6.6
7	15 3.1	14 58.6	55 7.8	−1.47	54 51.2	−1.28	6 54.4	1.95	7.6
8	14 54.8	14 51.6	54 37.1	1.07	54 25.5	0.87	7 39.7	1.84	8.6
9	14 49.1	14 47.1	54 16.1	0.68	54 9.1	0.49	8 22.9	1.76	9.6
10	14 45.9	14 45.1	54 4.4	−0.31	54 1.7	−0.13	9 4.5	1.72	10.6
11	14 45.0	14 45.3	54 1.1	+0.02	54 2.3	+0.17	9 45.6	1.71	11.6
12	14 46.1	14 47.3	54 5.2	0.31	54 9.7	0.43	10 26.7	1.73	12.6
13	14 48.9	14 50.9	54 15.6	+0.55	54 22.9	+0.65	11 8.8	1.78	13.6
14	14 53.2	14 55.8	54 31.3	0.75	54 40.8	0.83	11 52.5	1.86	14.6
15	14 58.6	15 1.7	54 51.2	0.91	55 2.6	0.98	12 38.4	1.96	15.6
16	15 5.0	15 8.5	55 14.7	+1.07	55 27.7	+1.11	13 26.8	2.07	16.6
17	15 12.3	15 16.2	55 41.4	1.17	55 55.8	1.23	14 17.8	2.17	17.6
18	15 20.3	15 24.6	56 10.9	1.29	56 26.7	1.35	15 10.9	2.24	18.6
19	15 29.1	15 33.8	56 43.2	+1.40	57 0.4	+1.45	16 5.2	2.28	19.6
20	15 38.6	15 43.6	57 18.1	1.50	57 36.4	1.54	16 59.8	2.27	20.6
21	15 48.7	15 53.8	57 55.1	1.57	58 14.0	1.58	17 53.9	2.24	21.6
22	15 59.0	16 4.1	58 33.0	+1.57	58 51.8	+1.55	18 47.1	2.19	22.6
23	16 9.1	16 13.8	59 10.0	1.48	59 27.4	1.40	19 39.4	2.17	23.6
24	16 18.2	16 22.1	59 43.5	1.27	59 57.9	1.10	20 31.3	2.17	24.6
25	16 25.4	16 28.1	60 10.1	+0.90	60 19.7	+0.67	21 23.6	2.20	25.6
26	16 29.8	16 30.7	60 26.3	+0.40	60 29.5	+0.11	22 17.1	2.26	26.6
27	16 30.6	16 29.4	60 29.0	−0.19	60 24.8	−0.51	23 12.2	2.34	27.6
28	16 27.3	16 24.1	60 16.8	−0.82	60 5.1	−1.12	☌		28.6
29	16 20.0	16 15.0	59 50.0	1.39	59 31.7	1.63	0 9.2	2.40	0.3
30	16 9.3	16 3.0	59 10.8	1.83	58 47.7	1.98	1 7.3	2.43	1.3
31	15 56.3	15 49.3	58 23.1	−2.09	57 57.5	−2.15	2 5.5	2.40	2.3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 1.					TUESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 3 39.75	2.4467	N.15 55 43.1	10.140	0	4 1 58.63	2.4591	N.21 34 59.0	3.781
1	2 6 6.60	2.4482	16 5 48.1	10.026	1	4 4 26.13	2.4576	21 38 41.7	3.640
2	2 8 33.54	2.4497	16 15 46.2	9.910	2	4 6 53.54	2.4560	21 42 15.9	3.499
3	2 11 0.56	2.4511	16 25 37.3	9.792	3	4 9 20.85	2.4544	21 45 41.6	3.358
4	2 13 27.67	2.4526	16 35 21.3	9.674	4	4 11 48.07	2.4527	21 48 58.9	3.217
5	2 15 54.87	2.4540	16 44 58.2	9.555	5	4 14 15.18	2.4510	21 52 7.7	3.076
6	2 18 22.15	2.4552	16 54 27.9	9.435	6	4 16 42.19	2.4492	21 55 8.0	2.936
7	2 20 49.50	2.4565	17 3 50.4	9.313	7	4 19 9.08	2.4472	21 58 0.0	2.796
8	2 23 16.93	2.4578	17 13 5.5	9.191	8	4 21 35.86	2.4453	22 0 43.5	2.655
9	2 25 44.44	2.4591	17 22 13.3	9.068	9	4 24 2.52	2.4432	22 3 18.6	2.515
10	2 28 12.02	2.4602	17 31 13.7	8.944	10	4 26 29.05	2.4411	22 5 45.3	2.376
11	2 30 39.67	2.4613	17 40 6.6	8.818	11	4 28 55.45	2.4388	22 8 3.7	2.237
12	2 33 7.38	2.4624	17 48 51.9	8.692	12	4 31 21.71	2.4365	22 10 13.7	2.097
13	2 35 35.16	2.4635	17 57 29.7	8.566	13	4 33 47.83	2.4342	22 12 15.4	1.958
14	2 38 3.00	2.4644	18 5 59.8	8.438	14	4 36 13.81	2.4317	22 14 8.7	1.819
15	2 40 30.89	2.4653	18 14 22.2	8.309	15	4 38 39.64	2.4292	22 15 53.7	1.681
16	2 42 58.84	2.4662	18 22 36.9	8.180	16	4 41 5.32	2.4266	22 17 30.4	1.543
17	2 45 26.83	2.4669	18 30 43.9	8.050	17	4 43 30.83	2.4239	22 18 58.9	1.406
18	2 47 54.87	2.4677	18 38 43.0	7.920	18	4 45 56.19	2.4212	22 20 19.1	1.268
19	2 50 22.96	2.4685	18 46 34.3	7.789	19	4 48 21.38	2.4184	22 21 31.1	1.132
20	2 52 51.09	2.4691	18 54 17.7	7.657	20	4 50 46.40	2.4155	22 22 34.9	0.996
21	2 55 19.25	2.4697	19 1 53.1	7.523	21	4 53 11.24	2.4126	22 23 30.6	0.860
22	2 57 47.45	2.4702	19 9 20.5	7.390	22	4 55 35.91	2.4096	22 24 18.1	0.724
23	3 0 15.67	2.4705	N.19 16 39.9	7.257	23	4 58 0.39	2.4065	N.22 24 57.5	0.589
	MONDAY 2.					WEDNESDAY 4.			
0	3 2 43.91	2.4709	N.19 23 51.3	7.122	0	5 0 24.69	2.4033	N.22 25 28.8	0.455
1	3 5 12.18	2.4713	19 30 54.5	6.986	1	5 2 48.79	2.4001	22 25 52.1	0.321
2	3 7 40.47	2.4716	19 37 49.6	6.851	2	5 5 12.70	2.3968	22 26 7.3	0.188
3	3 10 8.77	2.4717	19 44 36.6	6.715	3	5 7 36.41	2.3935	22 26 14.6	+ 0.056
4	3 12 37.08	2.4718	19 51 15.4	6.577	4	5 9 59.92	2.3901	22 26 14.0	− 0.077
5	3 15 5.39	2.4719	19 57 45.9	6.440	5	5 12 23.22	2.3866	22 26 5.4	0.209
6	3 17 33.71	2.4719	20 4 8.2	6.302	6	5 14 46.31	2.3830	22 25 48.9	0.340
7	3 20 2.02	2.4718	20 10 22.2	6.165	7	5 17 9.18	2.3794	22 25 24.6	0.470
8	3 22 30.33	2.4717	20 16 28.0	6.027	8	5 19 31.84	2.3757	22 24 52.5	0.600
9	3 24 58.62	2.4714	20 22 25.4	5.888	9	5 21 54.27	2.3720	22 24 12.6	0.730
10	3 27 26.90	2.4712	20 28 14.5	5.749	10	5 24 16.48	2.3682	22 23 24.9	0.858
11	3 29 55.16	2.4708	20 33 55.3	5.610	11	5 26 38.46	2.3645	22 22 29.6	0.986
12	3 32 23.39	2.4703	20 39 27.7	5.470	12	5 29 0.22	2.3607	22 21 26.6	1.113
13	3 34 51.60	2.4698	20 44 51.7	5.330	13	5 31 21.74	2.3567	22 20 16.0	1.240
14	3 37 19.77	2.4692	20 50 7.3	5.190	14	5 33 43.02	2.3527	22 18 57.8	1.366
15	3 39 47.90	2.4685	20 55 14.5	5.049	15	5 36 4.06	2.3486	22 17 32.1	1.491
16	3 42 15.99	2.4677	21 0 13.2	4.908	16	5 38 24.85	2.3445	22 15 58.9	1.615
17	3 44 44.03	2.4669	21 5 3.5	4.768	17	5 40 45.40	2.3404	22 14 18.3	1.739
18	3 47 12.02	2.4661	21 9 45.4	4.627	18	5 43 5.70	2.3362	22 12 30.2	1.862
19	3 49 39.96	2.4651	21 14 18.8	4.487	19	5 45 25.75	2.3320	22 10 34.8	1.984
20	3 52 7.83	2.4640	21 18 43.8	4.346	20	5 47 45.54	2.3277	22 8 32.1	2.105
21	3 54 35.64	2.4629	21 23 0.3	4.204	21	5 50 5.08	2.3235	22 6 22.2	2.226
22	3 57 3.38	2.4617	21 27 8.3	4.063	22	5 52 24.36	2.3191	22 4 5.0	2.347
23	3 59 31.04	2.4604	21 31 7.9	3.922	23	5 54 43.37	2.3147	22 1 40.6	2.466
24	4 1 58.63	2.4591	N.21 34 59.0	3.781	24	5 57 2.12	2.3102	N.21 59 9.1	2.583

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 5.					SATURDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 57 2.12	2.3102	N.21 59 9.1	2.583	0	7 42 26.52	2.0802	N.17 54 52.3	7.258
1	5 59 20.60	2.3058	21 56 30.6	2.701	1	7 44 31.19	2.0755	17 47 34.5	7.335
2	6 1 38.82	2.3013	21 53 45.0	2.818	2	7 46 35.58	2.0709	17 40 12.1	7.411
3	6 3 56.76	2.2967	21 50 52.4	2.934	3	7 48 39.70	2.0664	17 32 45.2	7.485
4	6 6 14.43	2.2922	21 47 52.9	3.049	4	7 50 43.55	2.0618	17 25 13.9	7.558
5	6 8 31.82	2.2876	21 44 46.5	3.164	5	7 52 47.12	2.0572	17 17 38.2	7.631
6	6 10 48.94	2.2830	21 41 33.2	3.277	6	7 54 50.42	2.0527	17 9 58.2	7.702
7	6 13 5.78	2.2783	21 38 13.2	3.389	7	7 56 53.45	2.0482	17 2 13.8	7.774
8	6 15 22.34	2.2737	21 34 46.5	3.501	8	7 58 56.21	2.0438	16 54 25.2	7.845
9	6 17 38.62	2.2690	21 31 13.1	3.612	9	8 0 58.71	2.0394	16 46 32.4	7.914
10	6 19 54.62	2.2642	21 27 33.0	3.722	10	8 3 0.94	2.0350	16 38 35.5	7.983
11	6 22 10.33	2.2595	21 23 46.4	3.832	11	8 5 2.91	2.0307	16 30 34.5	8.051
12	6 24 25.76	2.2547	21 19 53.2	3.941	12	8 7 4.62	2.0263	16 22 29.4	8.117
13	6 26 40.90	2.2499	21 15 53.5	4.048	13	8 9 6.07	2.0221	16 14 20.4	8.183
14	6 28 55.75	2.2451	21 11 47.4	4.154	14	8 11 7.27	2.0178	16 6 7.4	8.249
15	6 31 10.31	2.2402	21 7 35.0	4.260	15	8 13 8.21	2.0136	15 57 50.5	8.313
16	6 33 24.58	2.2354	21 3 16.2	4.366	16	8 15 8.90	2.0094	15 49 29.8	8.377
17	6 35 38.56	2.2306	20 58 51.1	4.470	17	8 17 9.34	2.0052	15 41 5.2	8.441
18	6 37 52.25	2.2257	20 54 19.8	4.572	18	8 19 9.53	2.0011	15 32 36.9	8.503
19	6 40 5.65	2.2208	20 49 42.4	4.675	19	8 21 9.47	1.9970	15 24 4.9	8.564
20	6 42 18.75	2.2159	20 44 58.8	4.777	20	8 23 9.17	1.9930	15 15 29.2	8.625
21	6 44 31.56	2.2111	20 40 9.2	4.877	21	8 25 8.63	1.9890	15 6 49.9	8.685
22	6 46 44.08	2.2062	20 35 13.5	4.977	22	8 27 7.85	1.9851	14 58 7.0	8.744
23	6 48 56.30	2.2012	N.20 30 11.9	5.075	23	8 29 6.84	1.9812	N.14 49 20.6	8.802
	FRIDAY 6.					SUNDAY 8.			
0	6 51 8.22	2.1962	N.20 25 4.5	5.172	0	8 31 5.59	1.9773	N.14 40 30.7	8.860
1	6 53 19.85	2.1914	20 19 51.2	5.270	1	8 33 4.11	1.9734	14 31 37.4	8.917
2	6 55 31.19	2.1865	20 14 32.1	5.367	2	8 35 2.40	1.9696	14 22 40.6	8.973
3	6 57 42.23	2.1816	20 9 7.2	5.462	3	8 37 0.46	1.9658	14 13 40.6	9.028
4	6 59 52.98	2.1767	20 3 36.7	5.556	4	8 38 58.30	1.9622	14 4 37.2	9.084
5	7 2 3.43	2.1717	19 58 0.5	5.650	5	8 40 55.92	1.9585	13 55 30.5	9.138
6	7 4 13.58	2.1667	19 52 18.7	5.742	6	8 42 53.32	1.9548	13 46 20.7	9.190
7	7 6 23.44	2.1619	19 46 31.4	5.834	7	8 44 50.50	1.9512	13 37 7.7	9.243
8	7 8 33.01	2.1570	19 40 38.6	5.925	8	8 46 47.47	1.9477	13 27 51.5	9.295
9	7 10 42.28	2.1521	19 34 40.4	6.015	9	8 48 44.23	1.9442	13 18 32.3	9.345
10	7 12 51.26	2.1472	19 28 36.8	6.104	10	8 50 40.78	1.9407	13 9 10.1	9.395
11	7 14 59.94	2.1423	19 22 27.9	6.192	11	8 52 37.12	1.9373	12 59 44.9	9.445
12	7 17 8.34	2.1375	19 16 13.8	6.279	12	8 54 33.26	1.9340	12 50 16.7	9.494
13	7 19 16.44	2.1326	19 9 54.4	6.366	13	8 56 29.20	1.9307	12 40 45.6	9.542
14	7 21 24.25	2.1277	19 3 29.9	6.452	14	8 58 24.94	1.9274	12 31 11.7	9.589
15	7 23 31.77	2.1229	18 57 0.2	6.537	15	9 0 20.49	1.9242	12 21 34.9	9.636
16	7 25 39.00	2.1181	18 50 25.5	6.620	16	9 2 15.84	1.9210	12 11 55.4	9.682
17	7 27 45.94	2.1132	18 43 45.8	6.702	17	9 4 11.01	1.9179	12 2 13.1	9.727
18	7 29 52.59	2.1084	18 37 1.2	6.785	18	9 6 5.99	1.9148	11 52 28.1	9.772
19	7 31 58.95	2.1037	18 30 11.6	6.867	19	9 8 0.79	1.9117	11 42 40.4	9.816
20	7 34 5.03	2.0990	18 23 17.2	6.947	20	9 9 55.40	1.9087	11 32 50.2	9.858
21	7 36 10.83	2.0942	18 16 18.0	7.026	21	9 11 49.84	1.9058	11 22 57.4	9.902
22	7 38 16.34	2.0895	18 9 14.1	7.104	22	9 13 44.10	1.9029	11 13 2.0	9.943
23	7 40 21.57	2.0848	18 2 5.5	7.182	23	9 15 38.19	1.9001	11 3 4.2	9.983
24	7 42 26.52	2.0802	N.17 54 52.3	7.258	24	9 17 32.11	1.8972	N.10 53 3.9	10.024

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 9.					WEDNESDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 17 32.11	1.8972	N.10 53 3.9	10.024	0	10 46 21.07	1.8233	N. 2 17 40.4	11.207
1	9 19 25.86	1.8945	10 43 1.2	10.064	1	10 48 10.46	1.8231	2 6 27.7	11.216
2	9 21 19.45	1.8918	10 32 56.2	10.103	2	10 49 59.84	1.8229	1 55 14.5	11.225
3	9 23 12.88	1.8892	10 22 48.8	10.142	3	10 51 49.21	1.8227	1 44 0.6	11.233
4	9 25 6.15	1.8866	10 12 39.2	10.179	4	10 53 38.57	1.8227	1 32 46.4	11.240
5	9 26 59.27	1.8841	10 2 27.3	10.216	5	10 55 27.93	1.8227	1 21 31.8	11.247
6	9 28 52.24	1.8816	9 52 13.3	10.252	6	10 57 17.29	1.8227	1 10 16.8	11.253
7	9 30 45.06	1.8792	9 41 57.0	10.289	7	10 59 6.65	1.8227	0 59 1.4	11.259
8	9 32 37.74	1.8767	9 31 38.6	10.324	8	11 0 56.01	1.8227	0 47 45.7	11.263
9	9 34 30.27	1.8743	9 21 18.1	10.358	9	11 2 45.38	1.8229	0 36 29.8	11.268
10	9 36 22.66	1.8721	9 10 55.6	10.392	10	11 4 34.76	1.8232	0 25 13.6	11.272
11	9 38 14.92	1.8698	9 0 31.1	10.425	11	11 6 24.16	1.8234	0 13 57.2	11.274
12	9 40 7.04	1.8676	8 50 4.6	10.457	12	11 8 13.57	1.8237	N. 0 2 40.7	11.277
13	9 41 59.03	1.8655	8 39 36.2	10.489	13	11 10 3.00	1.8241	S. 0 8 36.0	11.278
14	9 43 50.90	1.8634	8 29 5.9	10.521	14	11 11 52.46	1.8246	0 19 52.7	11.279
15	9 45 42.64	1.8613	8 18 33.7	10.552	15	11 13 41.95	1.8250	0 31 9.5	11.280
16	9 47 34.26	1.8593	8 7 59.7	10.581	16	11 15 31.46	1.8255	0 42 26.3	11.279
17	9 49 25.76	1.8574	7 57 24.0	10.610	17	11 17 21.01	1.8262	0 53 43.0	11.278
18	9 51 17.15	1.8556	7 46 46.5	10.639	18	11 19 10.60	1.8267	1 4 59.7	11.277
19	9 53 8.43	1.8537	7 36 7.3	10.667	19	11 21 0.22	1.8274	1 16 16.3	11.275
20	9 54 59.60	1.8519	7 25 26.4	10.695	20	11 22 49.89	1.8282	1 27 32.7	11.272
21	9 56 50.66	1.8502	7 14 43.9	10.722	21	11 24 39.60	1.8289	1 38 49.0	11.269
22	9 58 41.62	1.8485	7 3 59.8	10.747	22	11 26 29.36	1.8297	1 50 5.0	11.265
23	10 0 32.48	1.8469	N. 6 53 14.2	10.773	23	11 28 19.17	1.8306	S. 2 1 20.8	11.260
	TUESDAY 10.					THURSDAY 12.			
0	10 2 23.25	1.8453	N. 6 42 27.0	10.798	0	11 30 9.03	1.8315	S. 2 12 36.2	11.254
1	10 4 13.92	1.8437	6 31 38.4	10.822	1	11 31 58.95	1.8325	2 23 51.3	11.248
2	10 6 4.50	1.8423	6 20 48.3	10.846	2	11 33 48.93	1.8336	2 35 6.0	11.242
3	10 7 55.00	1.8410	6 9 56.9	10.868	3	11 35 38.98	1.8347	2 46 20.3	11.234
4	10 9 45.42	1.8396	5 59 4.1	10.891	4	11 37 29.09	1.8358	2 57 34.1	11.226
5	10 11 35.75	1.8383	5 48 10.0	10.912	5	11 39 19.27	1.8370	3 8 47.4	11.217
6	10 13 26.01	1.8370	5 37 14.6	10.933	6	11 41 9.53	1.8382	3 20 0.2	11.207
7	10 15 16.19	1.8358	5 26 18.0	10.954	7	11 42 59.86	1.8395	3 31 12.3	11.197
8	10 17 6.30	1.8347	5 15 20.1	10.974	8	11 44 50.27	1.8408	3 42 23.9	11.187
9	10 18 56.35	1.8336	5 4 21.1	10.993	9	11 46 40.76	1.8422	3 53 34.8	11.176
10	10 20 46.33	1.8325	4 53 20.9	11.012	10	11 48 31.33	1.8436	4 4 45.0	11.163
11	10 22 36.25	1.8315	4 42 19.6	11.030	11	11 50 21.99	1.8450	4 15 54.4	11.150
12	10 24 26.11	1.8306	4 31 17.3	11.047	12	11 52 12.73	1.8465	4 27 3.0	11.137
13	10 26 15.92	1.8297	4 20 14.0	11.064	13	11 54 3.57	1.8482	4 38 10.8	11.122
14	10 28 5.67	1.8288	4 9 9.6	11.081	14	11 55 54.51	1.8498	4 49 17.7	11.107
15	10 29 55.38	1.8281	3 58 4.3	11.095	15	11 57 45.55	1.8515	5 0 23.7	11.092
16	10 31 45.04	1.8273	3 46 58.2	11.110	16	11 59 36.69	1.8532	5 11 28.8	11.077
17	10 33 34.66	1.8267	3 35 51.1	11.125	17	12 1 27.93	1.8549	5 22 32.9	11.059
18	10 35 24.24	1.8260	3 24 43.2	11.138	18	12 3 19.28	1.8567	5 33 35.9	11.041
19	10 37 13.78	1.8254	3 13 34.5	11.152	19	12 5 10.74	1.8586	5 44 37.8	11.022
20	10 39 3.29	1.8249	3 2 25.0	11.164	20	12 7 2.31	1.8605	5 55 38.6	11.003
21	10 40 52.77	1.8245	2 51 14.8	11.175	21	12 8 54.00	1.8624	6 6 38.2	10.983
22	10 42 42.23	1.8241	2 40 4.0	11.186	22	12 10 45.80	1.8644	6 17 36.6	10.963
23	10 44 31.66	1.8237	2 28 52.5	11.197	23	12 12 37.73	1.8666	6 28 33.8	10.942
24	10 46 21.07	1.8233	N. 2 17 40.4	11.207	24	12 14 29.79	1.8687	S. 6 39 29.7	10.920

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 13.					SUNDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 14 29.79	1.8687	S. 6 39 29.7	10.920	0	13 47 23.97	2.0163	S. 14 43 42.4	8.947
1	12 16 21.97	1.8708	6 50 24.2	10.897	1	13 49 25.07	2.0201	14 52 37.4	8.886
2	12 18 14.28	1.8729	7 1 17.3	10.873	2	13 51 26.40	2.0240	15 1 28.7	8.823
3	12 20 6.72	1.8752	7 12 9.0	10.849	3	13 53 27.96	2.0280	15 10 16.2	8.760
4	12 21 59.30	1.8775	7 22 59.2	10.824	4	13 55 29.76	2.0320	15 18 59.9	8.696
5	12 23 52.02	1.8798	7 33 47.9	10.798	5	13 57 31.80	2.0359	15 27 39.7	8.631
6	12 25 44.88	1.8822	7 44 35.0	10.772	6	13 59 34.07	2.0398	15 36 15.6	8.566
7	12 27 37.88	1.8845	7 55 20.5	10.745	7	14 1 36.58	2.0438	15 44 47.6	8.499
8	12 29 31.02	1.8870	8 6 4.4	10.717	8	14 3 39.33	2.0478	15 53 15.5	8.432
9	12 31 24.32	1.8896	8 16 46.6	10.688	9	14 5 42.32	2.0518	16 1 39.4	8.363
10	12 33 17.77	1.8921	8 27 27.0	10.658	10	14 7 45.55	2.0558	16 9 59.1	8.294
11	12 35 11.37	1.8946	8 38 5.6	10.627	11	14 9 49.02	2.0598	16 18 14.7	8.224
12	12 37 5.12	1.8972	8 48 42.3	10.597	12	14 11 52.73	2.0639	16 26 26.0	8.152
13	12 38 59.03	1.8999	8 59 17.2	10.566	13	14 13 56.69	2.0680	16 34 33.0	8.081
14	12 40 53.11	1.9027	9 9 50.2	10.533	14	14 16 0.89	2.0721	16 42 35.7	8.008
15	12 42 47.35	1.9054	9 20 21.2	10.500	15	14 18 5.34	2.0762	16 50 34.0	7.935
16	12 44 41.76	1.9082	9 30 50.2	10.466	16	14 20 10.03	2.0802	16 58 27.9	7.860
17	12 46 36.33	1.9110	9 41 17.1	10.431	17	14 22 14.97	2.0843	17 6 17.2	7.784
18	12 48 31.08	1.9139	9 51 41.9	10.395	18	14 24 20.15	2.0884	17 14 2.0	7.708
19	12 50 26.00	1.9168	10 2 4.5	10.358	19	14 26 25.58	2.0926	17 21 42.2	7.632
20	12 52 21.10	1.9197	10 12 24.9	10.322	20	14 28 31.26	2.0967	17 29 17.8	7.553
21	12 54 16.37	1.9227	10 22 43.1	10.284	21	14 30 37.19	2.1008	17 36 48.6	7.474
22	12 56 11.83	1.9258	10 32 59.0	10.245	22	14 32 43.36	2.1049	17 44 14.7	7.395
23	12 58 7.47	1.9288	S. 10 43 12.5	10.205	23	14 34 49.78	2.1090	S. 17 51 36.0	7.315
	SATURDAY 14.					MONDAY 16.			
0	13 0 3.29	1.9319	S. 10 53 23.6	10.165	0	14 36 56.44	2.1132	S. 17 58 52.5	7.233
1	13 1 59.30	1.9351	11 3 32.3	10.124	1	14 39 3.36	2.1173	18 6 4.0	7.151
2	13 3 55.50	1.9382	11 13 38.5	10.082	2	14 41 10.52	2.1214	18 13 10.6	7.067
3	13 5 51.89	1.9415	11 23 42.1	10.038	3	14 43 17.93	2.1256	18 20 12.1	6.983
4	13 7 48.48	1.9448	11 33 43.1	9.995	4	14 45 25.59	2.1297	18 27 8.7	6.898
5	13 9 45.26	1.9481	11 43 41.6	9.951	5	14 47 33.50	2.1338	18 34 0.0	6.812
6	13 11 42.25	1.9514	11 53 37.3	9.905	6	14 49 41.65	2.1379	18 40 46.2	6.726
7	13 13 39.43	1.9547	12 3 30.2	9.859	7	14 51 50.05	2.1421	18 47 27.1	6.638
8	13 15 36.81	1.9581	12 13 20.4	9.812	8	14 53 58.70	2.1462	18 54 2.8	6.551
9	13 17 34.40	1.9615	12 23 7.7	9.764	9	14 56 7.59	2.1502	19 0 33.2	6.462
10	13 19 32.19	1.9649	12 32 52.1	9.716	10	14 58 16.73	2.1543	19 6 58.2	6.372
11	13 21 30.19	1.9684	12 42 33.6	9.667	11	15 0 26.11	2.1584	19 13 17.8	6.280
12	13 23 28.40	1.9720	12 52 12.1	9.617	12	15 2 35.74	2.1625	19 19 31.8	6.188
13	13 25 26.83	1.9756	13 1 47.6	9.565	13	15 4 45.61	2.1665	19 25 40.4	6.097
14	13 27 25.47	1.9791	13 11 19.9	9.513	14	15 6 55.72	2.1706	19 31 43.4	6.003
15	13 29 24.32	1.9827	13 20 49.1	9.461	15	15 9 6.08	2.1746	19 37 40.7	5.908
16	13 31 23.39	1.9863	13 30 15.2	9.407	16	15 11 16.67	2.1786	19 43 32.4	5.814
17	13 33 22.68	1.9900	13 39 38.0	9.352	17	15 13 27.51	2.1826	19 49 18.4	5.718
18	13 35 22.19	1.9937	13 48 57.5	9.297	18	15 15 38.58	2.1865	19 54 58.6	5.622
19	13 37 21.92	1.9974	13 58 13.6	9.241	19	15 17 49.89	2.1904	20 0 33.0	5.524
20	13 39 21.88	2.0012	14 7 26.4	9.184	20	15 20 1.43	2.1943	20 6 1.5	5.426
21	13 41 22.06	2.0049	14 16 35.7	9.126	21	15 22 13.21	2.1983	20 11 24.1	5.327
22	13 43 22.47	2.0067	14 25 41.5	9.067	22	15 24 25.23	2.2022	20 16 40.7	5.227
23	13 45 23.11	2.0125	14 34 43.7	9.007	23	15 26 37.47	2.2060	20 21 51.3	5.126
24	13 47 23.97	2.0163	S. 14 43 42.4	8.947	24	15 28 49.95	2.2099	S. 20 26 55.8	5.024

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
				TUESDAY 17.				
	h	m	s	s	°	′	″	″
0	15	28	49.95	2.2099	S. 20	26	55.8	5.024
1	15	31	2.66	2.2137	20	31	54.2	4.922
2	15	33	15.59	2.2173	20	36	46.5	4.820
3	15	35	28.74	2.2211	20	41	32.6	4.716
4	15	37	42.12	2.2248	20	46	12.4	4.612
5	15	39	55.72	2.2285	20	50	46.0	4.507
6	15	42	9.54	2.2322	20	55	13.2	4.401
7	15	44	23.58	2.2357	20	59	34.1	4.295
8	15	46	37.83	2.2393	21	3	48.6	4.187
9	15	48	52.30	2.2429	21	7	56.6	4.079
10	15	51	6.98	2.2464	21	11	58.1	3.971
11	15	53	21.87	2.2498	21	15	53.1	3.862
12	15	55	36.96	2.2532	21	19	41.5	3.751
13	15	57	52.26	2.2567	21	23	23.2	3.640
14	16	0	7.76	2.2600	21	26	58.3	3.529
15	16	2	23.46	2.2633	21	30	26.7	3.417
16	16	4	39.36	2.2666	21	33	48.5	3.305
17	16	6	55.45	2.2698	21	37	3.4	3.191
18	16	9	11.74	2.2730	21	40	11.4	3.077
19	16	11	28.21	2.2760	21	43	12.6	2.962
20	16	13	44.86	2.2791	21	46	6.9	2.847
21	16	16	1.70	2.2822	21	48	54.3	2.732
22	16	18	18.72	2.2851	21	51	34.7	2.615
23	16	20	35.91	2.2880	S. 21	54	8.1	2.498
				WEDNESDAY 18.				
0	16	22	53.28	2.2909	S. 21	56	34.5	2.382
1	16	25	10.82	2.2937	21	58	53.9	2.263
2	16	27	28.53	2.2965	22	1	6.1	2.144
3	16	29	46.40	2.2992	22	3	11.2	2.025
4	16	32	4.44	2.3019	22	5	9.1	1.906
5	16	34	22.63	2.3045	22	6	59.9	1.787
6	16	36	40.98	2.3071	22	8	43.5	1.666
7	16	38	59.48	2.3096	22	10	19.8	1.545
8	16	41	18.13	2.3120	22	11	48.9	1.423
9	16	43	36.92	2.3144	22	13	10.6	1.301
10	16	45	55.86	2.3167	22	14	25.0	1.179
11	16	48	14.93	2.3189	22	15	32.1	1.057
12	16	50	34.13	2.3212	22	16	31.8	0.933
13	16	52	53.47	2.3233	22	17	24.1	0.810
14	16	55	12.93	2.3253	22	18	9.0	0.686
15	16	57	32.51	2.3274	22	18	46.4	0.562
16	16	59	52.22	2.3294	22	19	16.4	0.437
17	17	2	12.04	2.3313	22	19	38.9	0.313
18	17	4	31.98	2.3332	22	19	54.0	0.188
19	17	6	52.02	2.3349	22	20	1.5	− 0.062
20	17	9	12.17	2.3367	22	20	1.4	+ 0.064
21	17	11	32.42	2.3383	22	19	53.8	0.189
22	17	13	52.77	2.3399	22	19	38.7	0.315
23	17	16	13.21	2.3414	22	19	16.0	0.442
24	17	18	33.74	2.3429	S. 22	18	45.6	0.569

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
				THURSDAY 19.				
	h	m	s	s	°	′	″	″
0	17	18	33.74	2.3429	S. 22	18	45.6	0.569
1	17	20	54.36	2.3442	22	18	7.7	0.695
2	17	23	15.05	2.3456	22	17	22.2	0.822
3	17	25	35.83	2.3469	22	16	29.0	0.950
4	17	27	56.68	2.3481	22	15	28.2	1.077
5	17	30	17.60	2.3492	22	14	19.7	1.205
6	17	32	38.58	2.3502	22	13	3.6	1.333
7	17	34	59.63	2.3513	22	11	39.8	1.461
8	17	37	20.74	2.3523	22	10	8.3	1.588
9	17	39	41.91	2.3532	22	8	29.2	1.716
10	17	42	3.13	2.3540	22	6	42.4	1.844
11	17	44	24.39	2.3547	22	4	47.9	1.972
12	17	46	45.69	2.3554	22	2	45.7	2.101
13	17	49	7.04	2.3561	22	0	35.8	2.229
14	17	51	28.42	2.3567	21	58	18.2	2.357
15	17	53	49.84	2.3572	21	55	53.0	2.484
16	17	56	11.28	2.3576	21	53	20.1	2.612
17	17	58	32.75	2.3580	21	50	39.5	2.741
18	18	0	54.24	2.3583	21	47	51.2	2.869
19	18	3	15.75	2.3587	21	44	55.2	2.997
20	18	5	37.28	2.3588	21	41	51.5	3.125
21	18	7	58.81	2.3589	21	38	40.2	3.252
22	18	10	20.35	2.3591	21	35	21.2	3.380
23	18	12	41.90	2.3591	S. 21	31	54.6	3.507
				FRIDAY 20.				
0	18	15	3.44	2.3590	S. 21	28	20.3	3.635
1	18	17	24.98	2.3590	21	24	38.4	3.762
2	18	19	46.52	2.3588	21	20	48.9	3.889
3	18	22	8.04	2.3586	21	16	51.7	4.016
4	18	24	29.55	2.3584	21	12	47.0	4.142
5	18	26	51.05	2.3582	21	8	34.7	4.267
6	18	29	12.53	2.3578	21	4	14.9	4.393
7	18	31	33.98	2.3573	20	59	47.5	4.520
8	18	33	55.41	2.3569	20	55	12.5	4.645
9	18	36	16.81	2.3564	20	50	30.1	4.770
10	18	38	38.18	2.3559	20	45	40.1	4.895
11	18	40	59.52	2.3553	20	40	42.7	5.019
12	18	43	20.82	2.3547	20	35	37.8	5.143
13	18	45	42.08	2.3540	20	30	25.5	5.267
14	18	48	3.30	2.3532	20	25	5.7	5.391
15	18	50	24.47	2.3524	20	19	38.6	5.513
16	18	52	45.59	2.3516	20	14	4.1	5.636
17	18	55	6.66	2.3507	20	8	22.3	5.758
18	18	57	27.68	2.3498	20	2	33.1	5.881
19	18	59	48.64	2.3489	19	56	36.6	6.002
20	19	2	9.55	2.3480	19	50	32.9	6.122
21	19	4	30.40	2.3469	19	44	22.0	6.242
22	19	6	51.18	2.3458	19	38	3.9	6.362
23	19	9	11.90	2.3448	19	31	38.6	6.482
24	19	11	32.56	2.3437	S. 19	25	6.1	6.600

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute	Declination.	Diff. for 1 Minute.
	SATURDAY 21.			
	h m s	s	° ′ ″	″
0	19 11 32.56	2.3437	S.19 25 6.1	6.600
1	19 13 53.15	2.3425	19 18 26.6	6.718
2	19 16 13.66	2.3412	19 11 39.9	6.837
3	19 18 34.10	2.3401	19 4 46.2	6.953
4	19 20 54.47	2.3388	18 57 45.5	7.070
5	19 23 14.76	2.3375	18 50 37.8	7.186
6	19 25 34.97	2.3363	18 43 23.2	7.301
7	19 27 55.11	2.3350	18 36 1.7	7.416
8	19 30 15.17	2.3336	18 28 33.3	7.530
9	19 32 35.14	2.3322	18 20 58.1	7.643
10	19 34 55.03	2.3308	18 13 16.1	7.756
11	19 37 14.84	2.3294	18 5 27.4	7.868
12	19 39 34.56	2.3279	17 57 31.9	7.980
13	19 41 54.19	2.3265	17 49 29.8	8.091
14	19 44 13.74	2.3251	17 41 21.0	8.201
15	19 46 33.20	2.3236	17 33 5.7	8.310
16	19 48 52.57	2.3221	17 24 43.8	8.419
17	19 51 11.85	2.3206	17 16 15.4	8.527
18	19 53 31.04	2.3190	17 7 40.5	8.634
19	19 55 50.13	2.3175	16 58 59.3	8.740
20	19 58 9.14	2.3160	16 50 11.6	8.846
21	20 0 28.05	2.3144	16 41 17.7	8.951
22	20 2 46.87	2.3129	16 32 17.5	9.055
23	20 5 5.60	2.3113	S.16 23 11.1	9.158
	SUNDAY 22.			
0	20 7 24.23	2.3097	S.16 13 58.6	9.260
1	20 9 42.77	2.3082	16 4 39.9	9.362
2	20 12 1.22	2.3067	15 55 15.2	9.463
3	20 14 19.58	2.3052	15 45 44.4	9.563
4	20 16 37.84	2.3036	15 36 7.6	9.662
5	20 18 56.01	2.3021	15 26 24.9	9.760
6	20 21 14.09	2.3005	15 16 36.4	9.857
7	20 23 32.07	2.2989	15 6 42.1	9.953
8	20 25 49.96	2.2974	14 56 42.0	10.049
9	20 28 7.76	2.2958	14 46 36.2	10.144
10	20 30 25.46	2.2942	14 36 24.7	10.237
11	20 32 43.07	2.2928	14 26 7.7	10.329
12	20 35 0.60	2.2913	14 15 45.2	10.421
13	20 37 18.03	2.2898	14 5 17.2	10.512
14	20 39 35.38	2.2884	13 54 43.7	10.602
15	20 41 52.64	2.2869	13 44 4.9	10.691
16	20 44 9.81	2.2855	13 33 20.8	10.779
17	20 46 26.90	2.2841	13 22 31.4	10.866
18	20 48 43.90	2.2827	13 11 36.9	10.952
19	20 51 0.82	2.2812	13 0 37.2	11.037
20	20 53 17.65	2.2798	12 49 32.4	11.121
21	20 55 34.40	2.2785	12 38 22.7	11.203
22	20 57 51.07	2.2772	12 27 8.0	11.286
23	21 0 7.66	2.2759	12 15 48.4	11.366
24	21 2 24.18	2.2747	S.12 4 24.1	11.445

Hour.	Right Ascension.	Diff. for 1 Minute	Declination.	Diff. for 1 Minute.
	MONDAY 23.			
	h m s	s	° ′ ″	″
0	21 2 24.18	2.2747	S.12 4 24.1	11.445
1	21 4 40.62	2.2733	11 52 55.0	11.524
2	21 6 56.98	2.2722	11 41 21.2	11.602
3	21 9 13.28	2.2710	11 29 42.8	11.678
4	21 11 29.50	2.2698	11 17 59.8	11.754
5	21 13 45.65	2.2687	11 6 12.3	11.828
6	21 16 1.74	2.2676	10 54 20.3	11.901
7	21 18 17.76	2.2665	10 42 24.1	11.972
8	21 20 33.72	2.2654	10 30 23.6	12.043
9	21 22 49.61	2.2644	10 18 18.9	12.113
10	21 25 5.45	2.2635	10 6 10.0	12.182
11	21 27 21.23	2.2625	9 53 57.0	12.250
12	21 29 36.95	2.2616	9 41 40.0	12.316
13	21 31 52.62	2.2607	9 29 19.1	12.381
14	21 34 8.24	2.2599	9 16 54.3	12.445
15	21 36 23.81	2.2591	9 4 25.7	12.508
16	21 38 39.33	2.2583	8 51 53.3	12.570
17	21 40 54.81	2.2576	8 39 17.3	12.629
18	21 43 10.24	2.2568	8 26 37.8	12.688
19	21 45 25.63	2.2562	8 13 54.7	12.747
20	21 47 40.99	2.2557	8 1 8.2	12.803
21	21 49 56.32	2.2552	7 48 18.3	12.859
22	21 52 11.61	2.2546	7 35 25.1	12.913
23	21 54 26.87	2.2541	S. 7 22 28.7	12.966
	TUESDAY 24.			
0	21 56 42.10	2.2537	S. 7 9 29.2	13.017
1	21 58 57.31	2.2533	6 56 26.7	13.067
2	22 1 12.49	2.2529	6 43 21.1	13.117
3	22 3 27.66	2.2527	6 30 12.7	13.164
4	22 5 42.81	2.2524	6 17 1.4	13.211
5	22 7 57.95	2.2522	6 3 47.4	13.256
6	22 10 13.08	2.2521	5 50 30.7	13.300
7	22 12 28.20	2.2519	5 37 11.4	13.342
8	22 14 43.31	2.2518	5 23 49.6	13.383
9	22 16 58.42	2.2518	5 10 25.4	13.423
10	22 19 13.53	2.2518	4 56 58.8	13.462
11	22 21 28.64	2.2519	4 43 29.9	13.499
12	22 23 43.76	2.2520	4 29 58.9	13.534
13	22 25 58.88	2.2522	4 16 25.8	13.569
14	22 28 14.02	2.2525	4 2 50.6	13.602
15	22 30 29.18	2.2527	3 49 13.5	13.634
16	22 32 44.35	2.2530	3 35 34.5	13.664
17	22 34 59.54	2.2534	3 21 53.8	13.692
18	22 37 14.76	2.2538	3 8 11.4	13.720
19	22 39 30.00	2.2542	2 54 27.4	13.746
20	22 41 45.27	2.2548	2 40 41.9	13.771
21	22 44 0.58	2.2554	2 26 54.9	13.794
22	22 46 15.92	2.2560	2 13 6.6	13.815
23	22 48 31.30	2.2567	1 59 17.1	13.835
24	22 50 46.72	2.2574	S. 1 45 26.4	13.854

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute	Declination.	Diff. for 1 Minute.
	WEDNESDAY 25.					FRIDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 50 46.72	2.2574	S. 1 45 26.4	13.854	0	0 40 52.65	2.3464	N. 9 12 4.4	12.931
1	22 53 2.19	2.2582	1 31 34.5	13.872	1	0 43 13.52	2.3492	9 24 58.5	12.872
2	22 55 17.70	2.2589	1 17 41.7	13.887	2	0 45 34.55	2.3519	9 37 49.1	12.812
3	22 57 33.26	2.2598	1 3 48.0	13.902	3	0 47 55.75	2.3547	9 50 36.0	12.751
4	22 59 48.88	2.2607	0 49 53.5	13.915	4	0 50 17.12	2.3576	10 3 19.2	12.687
5	23 2 4.55	2.2617	0 35 58.2	13.927	5	0 52 38.66	2.3604	10 15 58.5	12.622
6	23 4 20.29	2.2628	0 22 2.3	13.936	6	0 55 0.37	2.3632	10 28 33.8	12.555
7	23 6 36.09	2.2639	S. 0 8 5.9	13.944	7	0 57 22.25	2.3661	10 41 5.1	12.487
8	23 8 51.96	2.2650	N. 0 5 51.0	13.952	8	0 59 44.30	2.3689	10 53 32.3	12.418
9	23 11 7.89	2.2662	0 19 48.3	13.957	9	1 2 6.52	2.3717	11 5 55.3	12.347
10	23 13 23.90	2.2674	0 33 45.9	13.961	10	1 4 28.91	2.3747	11 18 13.9	12.273
11	23 15 39.98	2.2686	0 47 43.6	13.962	11	1 6 51.48	2.3776	11 30 28.1	12.199
12	23 17 56.13	2.2699	1 1 41.4	13.963	12	1 9 14.22	2.3805	11 42 37.9	12.123
13	23 20 12.37	2.2713	1 15 39.2	13.962	13	1 11 37.14	2.3834	11 54 43.0	12.045
14	23 22 28.69	2.2727	1 29 36.9	13.960	14	1 14 0.23	2.3863	12 6 43.3	11.965
15	23 24 45.10	2.2742	1 43 34.4	13.957	15	1 16 23.50	2.3893	12 18 38.8	11.885
16	23 27 1.60	2.2757	1 57 31.7	13.952	16	1 18 46.95	2.3922	12 30 29.5	11.803
17	23 29 18.19	2.2773	2 11 28.6	13.944	17	1 21 10.57	2.3951	12 42 15.2	11.719
18	23 31 34.88	2.2789	2 25 25.0	13.935	18	1 23 34.36	2.3980	12 53 55.8	11.633
19	23 33 51.66	2.2806	2 39 20.8	13.925	19	1 25 58.33	2.4009	13 5 31.2	11.547
20	23 36 8.55	2.2823	2 53 16.0	13.913	20	1 28 22.47	2.4038	13 17 1.4	11.458
21	23 38 25.54	2.2840	3 7 10.4	13.900	21	1 30 46.79	2.4067	13 28 26.2	11.369
22	23 40 42.63	2.2858	3 21 4.0	13.886	22	1 33 11.28	2.4096	13 39 45.7	11.278
23	23 42 59.83	2.2877	N. 3 34 56.7	13.869	23	1 35 35.94	2.4124	N. 13 50 59.6	11.185
	THURSDAY 26.					SATURDAY 28.			
0	23 45 17.15	2.2896	N. 3 48 48.3	13.851	0	1 38 0.77	2.4153	N. 14 2 7.9	11.091
1	23 47 34.58	2.2915	4 2 38.8	13.832	1	1 40 25.78	2.4182	14 13 10.5	10.995
2	23 49 52.13	2.2935	4 16 28.1	13.810	2	1 42 50.95	2.4210	14 24 7.3	10.898
3	23 52 9.80	2.2955	4 30 16.0	13.787	3	1 45 16.30	2.4239	14 34 58.3	10.800
4	23 54 27.59	2.2976	4 44 2.5	13.762	4	1 47 41.82	2.4267	14 45 43.3	10.700
5	23 56 45.51	2.2997	4 57 47.5	13.737	5	1 50 7.50	2.4294	14 56 22.3	10.598
6	23 59 3.55	2.3018	5 11 30.9	13.709	6	1 52 33.35	2.4322	15 6 55.1	10.496
7	0 1 21.73	2.3040	5 25 12.6	13.679	7	1 54 59.36	2.4349	15 17 21.8	10.392
8	0 3 40.03	2.3062	5 38 52.4	13.648	8	1 57 25.54	2.4377	15 27 42.2	10.287
9	0 5 58.47	2.3085	5 52 30.3	13.616	9	1 59 51.88	2.4403	15 37 56.2	10.181
10	0 8 17.05	2.3108	6 6 6.3	13.582	10	2 2 18.37	2.4429	15 48 3.9	10.073
11	0 10 35.77	2.3131	6 19 40.2	13.546	11	2 4 45.03	2.4456	15 58 5.0	9.963
12	0 12 54.62	2.3154	6 33 11.8	13.508	12	2 7 11.84	2.4481	16 7 59.5	9.853
13	0 15 13.62	2.3178	6 46 41.1	13.469	13	2 9 38.80	2.4507	16 17 47.4	9.742
14	0 17 32.76	2.3203	7 0 8.1	13.428	14	2 12 5.92	2.4532	16 27 28.5	9.628
15	0 19 52.06	2.3228	7 13 32.5	13.386	15	2 14 33.19	2.4557	16 37 2.8	9.514
16	0 22 11.50	2.3253	7 26 54.4	13.342	16	2 17 0.60	2.4580	16 46 30.2	9.399
17	0 24 31.10	2.3279	7 40 13.6	13.297	17	2 19 28.15	2.4604	16 55 50.7	9.283
18	0 26 50.85	2.3304	7 53 30.0	13.249	18	2 21 55.85	2.4627	17 5 4.2	9.166
19	0 29 10.75	2.3330	8 6 43.5	13.200	19	2 24 23.68	2.4650	17 14 10.6	9.047
20	0 31 30.81	2.3357	8 19 54.0	13.150	20	2 26 51.65	2.4672	17 23 9.8	8.927
21	0 33 51.03	2.3383	8 33 1.5	13.098	21	2 29 19.75	2.4694	17 32 1.8	8.806
22	0 36 11.41	2.3410	8 46 5.8	13.044	22	2 31 47.98	2.4716	17 40 46.5	8.684
23	0 38 31.95	2.3437	8 59 6.8	12.988	23	2 34 16.34	2.4737	17 49 23.9	8.561
24	0 40 52.65	2.3464	N. 9 12 4.4	12.931	24	2 36 44.82	2.4757	N. 17 57 53.8	8.437

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 36 44.82	2.4757	N.17 57 53.8	8.437
1	2 39 13.42	2.4777	18 6 16.3	8.312
2	2 41 42.14	2.4796	18 14 31.2	8.185
3	2 44 10.97	2.4814	18 22 38.6	8.058
4	2 46 39.91	2.4832	18 30 38.3	7.931
5	2 49 8.95	2.4849	18 38 30.3	7.802
6	2 51 38.10	2.4866	18 46 14.5	7.677
7	2 54 7.34	2.4882	18 53 50.9	7.542
8	2 56 36.68	2.4897	19 1 19.5	7.410
9	2 59 6.10	2.4911	19 8 40.1	7.278
10	3 1 35.61	2.4925	19 15 52.8	7.145
11	3 4 5.20	2.4938	19 22 57.5	7.010
12	3 6 34.86	2.4950	19 29 54.0	6.875
13	3 9 4.60	2.4962	19 36 42.5	6.741
14	3 11 34.40	2.4972	19 43 22.9	6.605
15	3 14 4.26	2.4982	19 49 55.1	6.468
16	3 16 34.18	2.4991	19 56 19.1	6.332
17	3 19 4.15	2.4999	20 2 34.9	6.193
18	3 21 34.17	2.5007	20 8 42.3	6.054
19	3 24 4.23	2.5013	20 14 41.4	5.916
20	3 26 34.32	2.5018	20 20 32.2	5.777
21	3 29 4.45	2.5023	20 26 14.6	5.637
22	3 31 34.60	2.5027	20 31 48.6	5.496
23	3 34 4.78	2.5031	N.20 37 14.1	5.354

MONDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 36 34.97	2.5033	N.20 42 31.1	5.213
1	3 39 5.17	2.5034	20 47 39.7	5.072
2	3 41 35.38	2.5034	20 52 39.8	4.930
3	3 44 5.58	2.5033	20 57 31.3	4.787
4	3 46 35.78	2.5032	21 2 14.3	4.645
5	3 49 5.97	2.5030	21 6 48.7	4.502
6	3 51 36.14	2.5027	21 11 14.5	4.358
7	3 54 6.29	2.5022	21 15 31.7	4.215
8	3 56 36.41	2.5017	21 19 40.3	4.072
9	3 59 6.50	2.5012	21 23 40.3	3.927
10	4 1 36.55	2.5004	21 27 31.6	3.783
11	4 4 6.55	2.4996	21 31 14.4	3.640
12	4 6 36.50	2.4987	21 34 48.5	3.496
13	4 9 6.40	2.4977	21 38 13.9	3.352
14	4 11 36.23	2.4966	21 41 30.7	3.207
15	4 14 5.99	2.4954	21 44 38.8	3.063
16	4 16 35.68	2.4942	21 47 38.3	2.919
17	4 19 5.29	2.4928	21 50 29.1	2.775
18	4 21 34.81	2.4912	21 53 11.3	2.632
19	4 24 4.24	2.4897	21 55 44.9	2.487
20	4 26 33.57	2.4880	21 58 9.8	2.343
21	4 29 2.80	2.4862	22 0 26.1	2.200
22	4 31 31.92	2.4844	22 2 33.8	2.057
23	4 34 0.93	2.4824	22 4 32.9	1.913
24	4 36 29.81	2.4803	N.22 6 23.4	1.770

TUESDAY, MAY 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	4 36 29.81	2.4803	N.22 6 23.4	1.770

PHASES OF THE MOON.

			d	h	m
☽	First Quarter	April	6	8	54.7
○	Full Moon		14	13	2.1
☾	Last Quarter		22	2	33.4
●	New Moon		28	17	23.3

			d	h
☾	Apogee	April	10	22.1
☾	Perigee		26	17.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	SUN	W.	23 10 46	2526	24 51 23	2530	26 31 55	2538	28 12 15	2548
	Pollux	E.	77 17 16	2208	75 29 0	2224	73 41 8	2239	71 53 39	2256
	Regulus	E.	114 5 53	2162	112 16 28	2176	110 27 25	2190	108 38 43	2204
2	SUN	W.	36 30 0	2615	38 8 35	2632	39 46 47	2649	41 24 36	2665
	Pollux	E.	63 2 43	2349	61 17 55	2371	59 33 37	2391	57 49 49	2411
	Regulus	E.	99 40 55	2286	97 54 35	2303	96 8 40	2321	94 23 11	2338
3	SUN	W.	49 27 48	2757	51 3 12	2776	52 38 11	2795	54 12 45	2815
	Pollux	E.	49 18 41	2529	47 38 8	2554	45 58 10	2580	44 18 48	2608
	Regulus	E.	85 42 18	2431	83 59 28	2450	82 17 5	2470	80 35 9	2488
4	SUN	W.	61 59 9	2914	63 31 10	2933	65 2 47	2953	66 33 59	2973
	VENUS	W.	18 16 23	2938	19 47 54	2958	21 19 0	2977	22 49 43	2997
	Pollux	E.	36 11 45	2763	34 36 28	2799	33 1 59	2837	31 28 19	2878
	Regulus	E.	72 12 9	2585	70 32 53	2604	68 54 3	2622	67 15 38	2641
5	SUN	W.	74 4 0	3066	75 32 51	3083	77 1 21	3101	78 29 29	3119
	VENUS	W.	30 17 12	3091	31 45 33	3110	33 13 31	3127	34 41 8	3144
	Aldebaran	W.	21 15 18	2869	22 48 17	2869	24 21 16	2871	25 54 14	2873
	Regulus	E.	59 9 53	2733	57 33 57	2751	55 58 25	2769	54 23 16	2786
	Spica	E.	113 4 1	2709	111 27 33	2726	109 51 28	2742	108 15 44	2759
6	SUN	W.	85 44 59	3201	87 11 7	3216	88 36 57	3231	90 2 29	3246
	VENUS	W.	41 54 5	3227	43 19 42	3242	44 45 1	3257	46 10 3	3272
	Aldebaran	W.	33 37 41	2904	35 9 55	2913	36 41 57	2922	38 13 48	2931
	Regulus	E.	46 33 8	2871	45 0 12	2887	43 27 36	2903	41 55 21	2919
	Spica	E.	100 22 18	2835	98 48 36	2849	97 15 12	2862	95 42 5	2876
7	SUN	W.	97 6 6	3311	98 30 5	3324	99 53 49	3336	101 17 19	3346
	VENUS	W.	53 11 6	3338	54 34 34	3350	55 57 48	3361	57 20 49	3372
	Aldebaran	W.	45 50 4	2978	47 20 44	2986	48 51 14	2995	50 21 33	3004
	Regulus	E.	34 19 9	2999	32 48 55	3016	31 19 2	3032	29 49 29	3049
	Spica	E.	88 0 40	2938	86 29 9	2948	84 57 51	2959	83 26 47	2969
8	SUN	W.	108 11 58	3393	109 34 22	3402	110 56 36	3409	112 18 42	3416
	VENUS	W.	64 13 0	3419	65 34 55	3427	66 56 41	3434	68 18 19	3441
	Aldebaran	W.	57 50 37	3041	59 19 59	3047	60 49 13	3054	62 18 19	3060
	Spica	E.	75 54 22	3013	74 24 25	3020	72 54 37	3027	71 24 58	3034
9	SUN	W.	119 7 18	3446	120 28 42	3451	121 50 1	3456	123 11 15	3460
	VENUS	W.	75 4 40	3470	76 25 38	3474	77 46 31	3478	79 7 20	3481
	Aldebaran	W.	69 42 14	3082	71 10 45	3087	72 39 11	3090	74 7 33	3093
	Spica	E.	63 58 34	3060	62 29 36	3064	61 0 43	3068	59 31 54	3072
	JUPITER	E.	112 12 40	3044	110 43 22	3048	109 14 9	3051	107 45 0	3054
10	SUN	W.	129 56 28	3473	131 17 22	3475	132 38 14	3476	133 59 5	3477
	VENUS	W.	85 50 36	3492	87 11 9	3493	88 31 41	3493	89 52 13	3494
	Aldebaran	W.	81 28 40	3101	82 56 48	3102	84 24 55	3103	85 53 1	3103
	Pollux	W.	40 6 14	3234	41 31 43	3227	42 57 20	3220	44 23 6	3212
	Spica	E.	52 8 44	3082	50 40 13	3083	49 11 43	3084	47 43 14	3085
	JUPITER	E.	100 20 1	3064	98 51 7	3065	97 22 15	3065	95 53 23	3065

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Sun	W.	29 52 22	2559	31 32 16	2572	33 11 51	2586	34 51 5	2600
	Pollux	E.	70 6 35	2274	68 19 57	2291	66 33 45	2310	64 48 0	2329
	Regulus	E.	106 50 22	2220	105 2 25	2236	103 14 51	2252	101 27 41	2268
2	Sun	W.	43 2 3	2683	44 39 6	2701	46 15 45	2719	47 51 59	2738
	Pollux	E.	56 6 30	2433	54 23 43	2457	52 41 30	2480	50 59 49	2503
	Regulus	E.	92 38 7	2357	90 53 30	2375	89 9 19	2394	87 25 35	2412
3	Sun	W.	55 46 53	2835	57 20 35	2855	58 53 51	2875	60 26 42	2894
	Pollux	E.	42 40 4	2637	41 1 59	2666	39 24 33	2696	37 47 48	2728
	Regulus	E.	78 53 39	2507	77 12 36	2527	75 32 1	2546	73 51 52	2565
4	Sun	W.	68 4 46	2991	69 35 10	3010	71 5 10	3029	72 34 46	3047
	Venus	W.	24 20 0	3016	25 49 53	3034	27 19 23	3054	28 48 29	3073
	Pollux	E.	29 55 32	2925	28 23 45	2975	26 53 1	3029	25 23 24	3091
	Regulus	E.	65 37 39	2660	64 0 6	2678	62 22 57	2697	60 46 13	2715
5	Sun	W.	79 57 15	3136	81 24 41	3153	82 51 47	3169	84 18 33	3186
	Venus	W.	36 8 24	3162	37 35 19	3178	39 1 54	3195	40 28 9	3211
	Aldebaran	W.	27 27 8	2876	28 59 58	2880	30 32 42	2887	32 5 17	2896
	Regulus	E.	52 48 30	2803	51 14 6	2821	49 40 5	2838	48 6 26	2854
	Spica	E.	106 40 22	2775	105 5 21	2790	103 30 40	2805	101 56 19	2820
6	Sun	W.	91 27 44	3259	92 52 43	3273	94 17 26	3287	95 41 53	3299
	Venus	W.	47 34 47	3286	48 59 15	3300	50 23 27	3313	51 47 24	3325
	Aldebaran	W.	39 45 27	2941	41 16 54	2950	42 48 9	2960	44 19 12	2969
	Regulus	E.	40 23 26	2935	38 51 52	2951	37 20 38	2966	35 49 43	2983
	Spica	E.	94 9 16	2889	92 36 43	2902	91 4 27	2914	89 32 26	2926
7	Sun	W.	102 40 38	3356	104 3 45	3366	105 26 40	3376	106 49 24	3385
	Venus	W.	58 43 38	3382	60 6 15	3392	61 28 40	3401	62 50 55	3410
	Aldebaran	W.	51 51 41	3012	53 21 39	3019	54 51 28	3027	56 21 7	3034
	Regulus	E.	28 20 17	3069	26 51 29	3088	25 23 5	3108	23 55 5	3129
	Spica	E.	81 55 55	2978	80 25 15	2987	78 54 47	2996	77 24 29	3005
8	Sun	W.	113 40 40	3423	115 2 30	3430	116 24 13	3436	117 45 49	3442
	Venus	W.	69 39 49	3447	71 1 12	3454	72 22 27	3460	73 43 36	3465
	Aldebaran	W.	63 47 18	3065	65 16 10	3069	66 44 57	3074	68 13 38	3078
	Spica	E.	69 55 27	3040	68 26 4	3046	66 56 48	3051	65 27 38	3056
9	Sun	W.	124 32 24	3463	125 53 30	3466	127 14 32	3469	128 35 31	3471
	Venus	W.	80 28 5	3484	81 48 47	3487	83 9 25	3489	84 30 1	3490
	Aldebaran	W.	75 35 52	3096	77 4 7	3097	78 32 20	3099	80 0 31	3101
	Spica	E.	58 3 10	3074	56 34 29	3077	55 5 52	3079	53 37 17	3081
	Jupiter	E.	106 15 54	3057	104 46 52	3060	103 17 53	3061	101 48 56	3063
10	Sun	W.	135 19 55	3479	136 40 43	3479	138 1 31	3479	139 22 19	3479
	Venus	W.	91 12 44	3494	92 33 15	3493	93 53 47	3492	95 14 20	3490
	Aldebaran	W.	87 21 7	3103	88 49 13	3102	90 17 20	3102	91 45 27	3101
	Pollux	W.	45 49 1	3206	47 15 3	3200	48 41 12	3194	50 7 28	3189
	Spica	E.	46 14 46	3086	44 46 19	3085	43 17 51	3084	41 49 22	3084
	Jupiter	E.	94 24 31	3065	92 55 39	3065	91 26 47	3064	89 57 53	3063

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
11	Venus	W.	96 34 55	3489	97 55 31	3488	99 16 9	3486	100 36 50	3483
	Aldebaran	W.	93 13 36	3100	94 41 46	3098	96 9 58	3096	97 38 12	3094
	Pollux	W.	51 33 53	3183	53 0 23	3176	54 27 1	3171	55 53 45	3166
	Spica	E.	40 20 53	3082	38 52 22	3082	37 23 50	3080	35 55 16	3078
	Jupiter	E.	88 28 58	3061	87 0 1	3060	85 31 2	3058	84 2 0	3056
12	Venus	W.	107 21 1	3466	108 42 3	3462	110 3 9	3458	111 24 20	3453
	Aldebaran	W.	105 0 7	3081	106 28 40	3077	107 57 18	3073	109 25 59	3070
	Pollux	W.	63 9 3	3138	64 36 27	3133	66 3 57	3127	67 31 34	3121
	Regulus	W.	26 7 9	3153	27 34 14	3141	29 1 34	3129	30 29 8	3118
	Jupiter	E.	76 36 3	3040	75 6 40	3036	73 37 12	3032	72 7 39	3027
	Saturn	E.	101 3 24	3059	99 34 24	3055	98 5 19	3051	96 36 8	3047
13	Aldebaran	W.	116 50 38	3050	118 19 49	3045	119 49 6	3041	121 18 28	3036
	Pollux	W.	74 51 26	3091	76 19 46	3086	77 48 13	3079	79 16 48	3073
	Regulus	W.	37 50 3	3072	39 18 47	3064	40 47 41	3056	42 16 45	3047
	Jupiter	E.	64 38 31	3004	63 8 23	2999	61 38 9	2993	60 7 48	2987
	Saturn	E.	89 8 55	3022	87 39 10	3018	86 9 19	3012	84 39 21	3006
	a Aquilæ	E.	113 30 23	3554	112 10 58	3537	110 51 15	3521	109 31 14	3506
14	Pollux	W.	86 41 39	3042	88 11 0	3035	89 40 29	3029	91 10 6	3022
	Regulus	W.	49 44 32	3009	51 14 34	3001	52 44 45	2993	54 15 6	2985
	Jupiter	E.	52 34 12	2958	51 3 7	2951	49 31 53	2945	48 0 31	2938
	Saturn	E.	77 7 42	2976	75 36 59	2970	74 6 9	2964	72 35 11	2957
	a Aquilæ	E.	102 47 14	3441	101 25 44	3430	100 4 1	3418	98 42 5	3408
15	Pollux	W.	98 40 12	2990	100 10 37	2984	101 41 10	2977	103 11 51	2970
	Regulus	W.	61 49 16	2947	63 20 35	2939	64 52 4	2931	66 23 43	2924
	Jupiter	E.	40 21 33	2905	38 49 20	2897	37 16 57	2890	35 44 25	2883
	Saturn	E.	64 58 11	2923	63 26 21	2915	61 54 21	2908	60 22 12	2901
	a Aquilæ	E.	91 49 44	3365	90 26 47	3358	89 3 42	3350	87 40 28	3344
16	Regulus	W.	74 4 25	2885	75 37 3	2876	77 9 52	2869	78 42 51	2860
	Spica	W.	20 0 58	2880	21 33 42	2872	23 6 37	2862	24 39 45	2852
	Jupiter	E.	27 59 26	2846	26 25 58	2839	24 52 21	2831	23 18 33	2824
	Saturn	E.	52 39 7	2863	51 6 1	2855	49 32 45	2848	47 59 19	2840
	a Aquilæ	E.	80 42 42	3319	79 18 53	3317	77 55 1	3315	76 31 7	3313
	Fomalhaut	E.	107 36 28	3383	106 13 52	3367	104 50 58	3352	103 27 47	3338
17	Regulus	W.	86 30 25	2819	88 4 28	2811	89 38 41	2803	91 13 6	2794
	Spica	W.	32 28 24	2807	34 2 43	2798	35 37 13	2789	37 11 55	2780
	Saturn	E.	40 9 33	2799	38 35 4	2792	37 0 25	2783	35 25 34	2775
	a Aquilæ	E.	69 31 18	3315	68 7 24	3318	66 43 33	3322	65 19 47	3328
	Fomalhaut	E.	96 27 56	3276	95 3 16	3265	93 38 24	3255	92 13 20	3246
	a Pegasi	E.	116 1 52	2969	114 31 0	2957	112 59 53	2944	111 28 30	2932
18	Regulus	W.	99 7 57	2751	100 43 29	2743	102 19 12	2734	103 55 7	2724
	Spica	W.	45 8 23	2735	46 44 16	2726	48 20 21	2716	49 56 39	2707
	Saturn	E.	27 28 35	2732	25 52 37	2724	24 16 29	2714	22 40 7	2706
	a Aquilæ	E.	58 23 3	3376	57 0 19	3391	55 37 52	3408	54 15 44	3427
	Fomalhaut	E.	85 5 26	3207	83 39 25	3202	82 13 18	3196	80 47 4	3190
	a Pegasi	E.	103 47 53	2875	102 15 2	2865	100 41 58	2854	99 8 40	2844

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
11	Venus	W.	101 57 33	3480	103 18 19	3477	104 39 9	3473	106 0 3	3470
	Aldebaran	W.	99 6 29	3091	100 34 49	3089	102 3 12	3087	103 31 38	3084
	Pollux	W.	57 20 35	3160	58 47 32	3154	60 14 36	3149	61 41 46	3143
	Spica	E.	34 26 39	3077	32 58 1	3074	31 29 20	3072	30 0 36	3069
	Jupiter	E.	82 32 56	3052	81 3 48	3050	79 34 37	3047	78 5 22	3043
12	Venus	W.	112 45 37	3448	114 6 59	3443	115 28 26	3438	116 49 59	3433
	Aldebaran	W.	110 54 45	3066	112 23 36	3062	113 52 31	3058	115 21 32	3054
	Pollux	W.	68 59 18	3115	70 27 9	3110	71 55 7	3103	73 23 13	3097
	Regulus	W.	31 56 56	3108	33 24 56	3099	34 53 7	3090	36 21 30	3081
	Jupiter	E.	70 38 0	3083	69 8 16	3019	67 38 28	3014	66 8 33	3009
	Saturn	E.	95 6 53	3042	93 37 32	3038	92 8 6	3033	90 38 34	3027
13	Aldebaran	W.	122 47 56	3031	124 17 30	3026	125 47 10	3022	127 16 55	3018
	Pollux	W.	80 45 31	3067	82 14 21	3060	83 43 19	3054	85 12 25	3047
	Regulus	W.	43 45 59	3039	45 15 23	3032	46 44 56	3024	48 14 39	3016
	Jupiter	E.	58 37 19	2982	57 6 44	2976	55 36 1	2969	54 5 10	2964
	Saturn	E.	83 9 16	3001	81 39 4	2994	80 8 44	2989	78 38 17	2982
	α Aquilæ	E.	108 10 56	3491	106 50 22	3479	105 29 34	3465	104 8 31	3453
14	Pollux	W.	92 39 51	3016	94 9 44	3009	95 39 45	3003	97 9 54	2996
	Regulus	W.	55 45 37	2978	57 16 17	2970	58 47 7	2962	60 18 7	2955
	Jupiter	E.	46 29 0	2931	44 57 21	2925	43 25 34	2918	41 53 38	2911
	Saturn	E.	71 4 4	2950	69 32 49	2944	68 1 26	2936	66 29 53	2929
	α Aquilæ	E.	97 19 58	3399	95 57 40	3389	94 35 11	3380	93 12 32	3372
15	Pollux	W.	104 42 41	2965	106 13 38	2958	107 44 43	2952	109 15 56	2946
	Regulus	W.	67 55 31	2916	69 27 29	2908	70 59 38	2900	72 31 57	2893
	Jupiter	E.	34 11 44	2876	32 38 54	2868	31 5 54	2861	29 32 45	2853
	Saturn	E.	58 49 54	2893	57 17 26	2887	55 44 50	2878	54 12 3	2871
	α Aquilæ	E.	86 17 7	3338	84 53 40	3332	83 30 6	3328	82 6 27	3323
16	Regulus	W.	80 16 1	2852	81 49 21	2845	83 22 51	2836	84 56 32	2827
	Spica	W.	26 13 5	2843	27 46 37	2834	29 20 21	2825	30 54 17	2816
	Jupiter	E.	21 44 36	2818	20 10 31	2811	18 36 17	2802	17 1 52	2793
	Saturn	E.	46 25 43	2831	44 51 56	2824	43 17 59	2815	41 43 51	2808
	α Aquilæ	E.	75 7 10	3312	73 43 12	3311	72 19 13	3312	70 55 15	3313
	Fomalhaut	E.	102 4 19	3324	100 40 35	3312	99 16 37	3299	97 52 24	3286
17	Regulus	W.	92 47 42	2785	94 22 29	2777	95 57 27	2769	97 32 36	2760
	Spica	W.	38 46 49	2772	40 21 54	2762	41 57 12	2753	43 32 42	2744
	Saturn	E.	33 50 33	2766	32 15 20	2758	30 39 57	2749	29 4 22	2740
	α Aquilæ	E.	63 56 8	3335	62 32 37	3342	61 9 14	3351	59 46 2	3363
	Fomalhaut	E.	90 48 5	3236	89 22 39	3229	87 57 4	3220	86 31 19	3214
	α Pegasi	E.	109 56 52	2920	108 24 59	2909	106 52 52	2898	105 20 30	2886
18	Regulus	W.	105 31 15	2716	107 7 34	2707	108 44 5	2697	110 20 47	2688
	Spica	W.	51 33 10	2698	53 9 53	2688	54 46 49	2678	56 23 58	2668
	Saturn	E.	21 3 35	2700	19 26 55	2692	17 50 4	2680	16 12 56	2668
	α Aquilæ	E.	52 53 58	3449	51 32 37	3475	50 11 45	3504	48 51 25	3535
	Fomalhaut	E.	79 20 43	3187	77 54 18	3183	76 27 49	3181	75 1 17	3178
	α Pegasi	E.	97 35 9	2833	96 1 24	2823	94 27 26	2813	92 53 15	2802

GREENWICH MEAN TIME.

LUNAR DISTANCES.

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			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
19	Spica	W.	58 1 21	2658	59 38 57	2649	61 16 45	2639	62 54 47	2628
	a Aquilæ	E.	47 31 40	3573	46 12 36	3616	44 54 19	3663	43 36 52	3716
	Fomalhaut	E.	73 34 42	3178	72 8 7	3178	70 41 31	3178	69 14 56	3180
	a Pegasi	E.	91 18 50	2792	89 44 12	2783	88 9 22	2773	86 34 19	2763
	Mars	E.	108 21 46	2944	106 50 23	2934	105 18 47	2922	103 46 56	2911
20	Spica	W.	71 8 29	2577	72 47 56	2566	74 27 37	2555	76 7 34	2544
	Jupiter	W.	23 30 19	2555	25 10 16	2544	26 50 28	2533	28 30 56	2522
	Fomalhaut	E.	62 3 7	3209	60 37 9	3220	59 11 24	3232	57 45 53	3247
	a Pegasi	E.	78 35 58	2718	76 59 42	2709	75 23 14	2700	73 46 34	2692
	Mars	E.	96 4 9	2855	94 30 52	2844	92 57 21	2831	91 23 34	2820
	Sun	E.	116 25 13	2916	114 53 14	2904	113 21 0	2892	111 48 31	2880
21	Spica	W.	84 31 8	2489	86 12 37	2477	87 54 23	2465	89 36 25	2454
	Jupiter	W.	36 57 11	2465	38 39 14	2453	40 21 33	2441	42 4 9	2429
	Fomalhaut	E.	50 43 41	3365	49 20 44	3399	47 58 26	3438	46 36 53	3484
	a Pegasi	E.	65 40 35	2655	64 2 54	2648	62 25 4	2642	60 47 6	2636
	Mars	E.	83 30 50	2761	81 55 31	2749	80 19 56	2737	78 44 5	2725
	Sun	E.	104 2 10	2818	102 28 6	2806	100 53 46	2794	99 19 10	2781
22	Spica	W.	98 10 39	2396	99 54 19	2384	101 38 16	2373	103 22 30	2361
	Jupiter	W.	50 41 18	2371	52 25 34	2359	54 10 7	2347	55 54 58	2336
	Saturn	W.	25 40 25	2393	27 24 10	2381	29 8 12	2368	30 52 32	2357
	Fomalhaut	E.	40 4 18	3830	38 49 47	3933	37 37 1	4051	36 26 12	4189
	a Pegasi	E.	52 35 42	2621	50 57 15	2620	49 18 47	2621	47 40 20	2624
	Mars	E.	70 40 48	2665	69 3 21	2652	67 25 37	2640	65 47 37	2629
	Sun	E.	91 22 0	2718	89 45 44	2705	88 9 11	2693	86 32 21	2681
23	Jupiter	W.	64 43 22	2279	66 29 53	2267	68 16 41	2256	70 3 46	2245
	Saturn	W.	39 38 26	2298	41 24 28	2287	43 10 46	2276	44 57 21	2264
	a Pegasi	E.	39 29 57	2671	37 52 38	2690	36 15 45	2714	34 39 24	2744
	Mars	E.	57 33 38	2572	55 54 4	2561	54 14 16	2550	52 34 12	2540
	Sun	E.	78 24 1	2618	76 45 31	2606	75 6 44	2594	73 27 41	2583
24	Jupiter	W.	79 3 9	2193	80 51 47	2182	82 40 41	2173	84 29 49	2162
	Saturn	W.	53 54 17	2212	55 42 26	2202	57 30 50	2192	59 19 29	2183
	a Aquilæ	W.	36 11 46	3769	37 27 20	3633	38 45 19	3515	40 5 26	3408
	Mars	E.	44 10 25	2493	42 29 2	2485	40 47 27	2478	39 5 43	2472
	Sun	E.	65 8 32	2527	63 27 57	2517	61 47 7	2507	60 6 3	2497
25	Jupiter	W.	93 38 50	2122	95 29 15	2116	97 19 50	2109	99 10 36	2103
	Saturn	W.	68 26 3	2142	70 15 58	2135	72 6 4	2128	73 56 21	2122
	a Aquilæ	W.	47 12 34	3025	48 42 16	2969	50 13 8	2920	51 45 2	2873
	Sun	E.	51 37 30	2455	49 55 13	2447	48 12 45	2440	46 30 7	2434
26	Jupiter	W.	108 26 36	2078	110 18 9	2075	112 9 47	2072	114 1 30	2070
	Saturn	W.	83 9 53	2098	85 0 56	2094	86 52 5	2091	88 43 18	2088
	Sun	E.	37 55 6	2412	36 11 49	2410	34 28 28	2408	32 45 5	2408
30	Sun	W.	17 8 39	2649	18 46 28	2655	20 24 9	2664	22 1 37	2675
	Pollux	E.	55 10 18	2388	53 26 26	2408	51 43 2	2427	50 0 6	2448
	Regulus	E.	91 40 14	2306	89 54 23	2320	88 8 53	2335	86 23 44	2350

GREENWICH MEAN TIME.

LUNAR DISTANCES.

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			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
19	Spica	W.	64 33 4	2618	66 11 34	2608	67 50 18	2598	69 29 16	2587
	a Aquilæ	E.	42 20 22	3778	41 4 57	3848	39 50 45	3927	38 37 53	4019
	Fomalhaut	E.	67 48 24	3183	66 21 55	3188	64 55 32	3193	63 29 15	3201
	a Pegasi	E.	84 59 3	2754	83 23 35	2745	81 47 55	2736	80 12 3	2726
	MARS	E.	102 14 51	2900	100 42 32	2889	99 9 59	2877	97 37 11	2866
20	Spica	W.	77 47 46	2533	79 28 13	2522	81 8 56	2511	82 49 54	2499
	JUPITER	W.	30 11 39	2510	31 52 38	2499	33 33 53	2487	35 15 24	2476
	Fomalhaut	E.	56 20 40	3265	54 55 47	3284	53 31 17	3307	52 7 14	3333
	a Pegasi	E.	72 9 43	2684	70 32 42	2676	68 55 30	2668	67 18 7	2661
	MARS	E.	89 49 32	2808	88 15 15	2796	86 40 42	2785	85 5 54	2772
	SUN	E.	110 15 46	2867	108 42 45	2855	107 9 29	2843	105 35 57	2831
21	Spica	W.	91 18 43	2443	93 1 17	2431	94 44 8	2419	96 27 15	2408
	JUPITER	W.	43 47 2	2418	45 30 11	2407	47 13 36	2394	48 57 19	2383
	Fomalhaut	E.	45 16 11	3536	43 56 27	3596	42 37 48	3663	41 20 22	3741
	a Pegasi	E.	59 9 0	2632	57 30 48	2627	55 52 30	2624	54 14 8	2621
	MARS	E.	77 7 58	2713	75 31 35	2701	73 54 56	2688	72 18 0	2676
	SUN	E.	97 44 17	2769	96 9 8	2756	94 33 42	2743	92 57 59	2731
22	Spica	W.	105 7 1	2350	106 51 48	2338	108 36 52	2326	110 22 13	2315
	JUPITER	W.	57 40 5	2324	59 25 29	2313	61 11 9	2301	62 57 7	2289
	SATURN	W.	32 37 9	2345	34 22 3	2334	36 7 13	2322	37 52 41	2310
	Fomalhaut	E.	35 17 36	4346	34 11 26	4532	33 8 2	4748	32 7 43	4997
	a Pegasi	E.	46 1 57	2628	44 23 40	2635	42 45 33	2643	41 7 37	2655
	MARS	E.	64 9 21	2617	62 30 49	2605	60 52 1	2593	59 12 57	2583
	SUN	E.	84 55 15	2668	83 17 52	2655	81 40 12	2643	80 2 15	2630
23	JUPITER	W.	71 51 7	2234	73 38 44	2223	75 26 37	2213	77 14 45	2202
	SATURN	W.	46 44 13	2253	48 31 21	2244	50 18 43	2233	52 6 22	2223
	a Pegasi	E.	33 3 43	2782	31 28 51	2828	29 54 59	2884	28 22 20	2954
	MARS	E.	50 53 54	2529	49 13 21	2520	47 32 36	2510	45 51 37	2501
	SUN	E.	71 48 23	2571	70 8 48	2560	68 28 58	2548	66 48 52	2538
24	JUPITER	W.	86 19 11	2155	88 8 47	2147	89 58 35	2138	91 48 36	2130
	SATURN	W.	61 8 22	2174	62 57 28	2166	64 46 47	2157	66 36 19	2149
	a Aquilæ	W.	41 27 34	3315	42 51 28	3229	44 17 3	3155	45 44 6	3085
	MARS	E.	37 23 51	2469	35 41 54	2464	33 59 50	2460	32 17 41	2455
	SUN	E.	58 24 45	2487	56 43 14	2479	55 1 31	2470	53 19 36	2462
25	JUPITER	W.	101 1 31	2097	102 52 35	2091	104 43 48	2086	106 35 9	2082
	SATURN	W.	75 46 47	2116	77 37 22	2111	79 28 5	2105	81 18 56	2101
	a Aquilæ	W.	53 17 55	2833	54 51 40	2795	56 26 14	2763	58 1 31	2732
	SUN	E.	44 47 21	2429	43 4 27	2424	41 21 26	2419	39 38 19	2415
26	JUPITER	W.	115 53 16	2068	117 45 5	2067	119 36 55	2066	121 28 47	2066
	SATURN	W.	90 34 35	2086	92 25 55	2086	94 17 15	2085	96 8 37	2085
	SUN	E.	31 1 41	2408	29 18 18	2409	27 34 56	2412	25 51 38	2415
30	SUN	W.	23 38 50	2687	25 15 47	2701	26 52 26	2714	28 28 47	2730
	Pollux	E.	48 17 40	2471	46 35 46	2494	44 54 24	2518	43 13 36	2543
	Regulus	E.	84 38 57	2366	82 54 33	2382	81 10 32	2398	79 26 54	2414

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	2 32 52.35	9.542	N.15 1 22.8	+45.49	15 53.15	65.97	2 57.14	0.314
Wed.	2	2 36 41.61	9.564	15 19 27.2	44.86	15 52.92	66.05	3 4.43	0.292
Thur.	3	2 40 31.40	9.586	15 37 16.3	44.22	15 52.69	66.13	3 11.17	0.270
Frid.	4	2 44 21.72	9.608	15 54 49.9	+43.57	15 52.46	66.21	3 17.39	0.248
Sat.	5	2 48 12.58	9.631	16 12 7.6	42.90	15 52.23	66.29	3 23.07	0.225
SUN.	6	2 52 3.99	9.654	16 29 9.2	42.22	15 52.00	66.37	3 28.20	0.202
Mon.	7	2 55 55.95	9.677	16 45 54.4	+41.53	15 51.78	66.45	3 32.78	0.179
Tues.	8	2 59 48.45	9.700	17 2 22.7	40.83	15 51.56	66.53	3 36.82	0.156
Wed.	9	3 3 41.52	9.723	17 18 34.0	40.11	15 51.34	66.61	3 40.30	0.133
Thur.	10	3 7 35.14	9.746	17 34 28.0	+39.38	15 51.12	66.69	3 43.23	0.110
Frid.	11	3 11 29.32	9.770	17 50 4.3	38.64	15 50.91	66.78	3 45.59	0.087
Sat.	12	3 15 24.06	9.793	18 5 22.9	37.89	15 50.70	66.86	3 47.40	0.063
SUN.	13	3 19 19.38	9.817	18 20 23.1	+37.13	15 50.50	66.94	3 48.64	0.039
Mon.	14	3 23 15.27	9.840	18 35 5.0	36.36	15 50.30	67.02	3 49.30	0.015
Tues.	15	3 27 11.72	9.864	18 49 28.0	35.57	15 50.10	67.10	3 49.40	0.009
Wed.	16	3 31 8.75	9.888	19 3 32.1	+34.77	15 49.90	67.18	3 48.92	0.032
Thur.	17	3 35 6.36	9.912	19 17 16.8	33.96	15 49.70	67.26	3 47.88	0.056
Frid.	18	3 39 4.54	9.936	19 30 42.1	33.14	15 49.51	67.34	3 46.25	0.080
Sat.	19	3 43 3.30	9.960	19 43 47.5	+32.31	15 49.32	67.42	3 44.06	0.104
SUN.	20	3 47 2.62	9.984	19 56 32.9	31.47	15 49.14	67.50	3 41.30	0.127
Mon.	21	3 51 2.52	10.007	20 8 58.0	30.61	15 48.96	67.58	3 37.97	0.150
Tues.	22	3 55 2.97	10.030	20 21 2.4	+29.74	15 48.79	67.65	3 34.09	0.173
Wed.	23	3 59 3.98	10.053	20 32 46.1	28.87	15 48.62	67.73	3 29.65	0.195
Thur.	24	4 3 5.53	10.075	20 44 8.6	27.99	15 48.45	67.80	3 24.66	0.217
Frid.	25	4 7 7.61	10.097	20 55 9.8	+27.09	15 48.28	67.87	3 19.15	0.239
Sat.	26	4 11 10.20	10.118	21 5 49.4	26.19	15 48.12	67.94	3 13.13	0.261
SUN.	27	4 15 13.31	10.138	21 16 7.2	25.28	15 47.96	68.01	3 6.61	0.282
Mon.	28	4 19 16.89	10.158	21 26 3.0	+24.36	15 47.81	68.07	2 59.60	0.303
Tues.	29	4 23 20.92	10.177	21 35 36.6	23.43	15 47.66	68.13	2 52.13	0.322
Wed.	30	4 27 25.43	10.195	21 44 47.7	22.49	15 47.51	68.19	2 44.21	0.340
Thur.	31	4 31 30.36	10.212	21 53 36.1	21.54	15 47.36	68.25	2 35.87	0.357
Frid.	32	4 35 35.70	10.229	N.22 2 1.6	+20.58	15 47.22	68.31	2 27.12	0.373

NOTE.—The mean time of semidiameter passing may be found by subtracting 0^{s}.18 from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	2 32 52.82	9.542	N.15 1 25.0	+45.49	2 57.16	0.314	2 35 49.98
Wed.	2	2 36 42.10	9.564	15 19 29.4	44.86	3 4.44	0.292	2 39 46.54
Thur.	3	2 40 31.91	9.586	15 37 18.6	44.22	3 11.18	0.270	2 43 43.09
Frid.	4	2 44 22.25	9.608	15 54 52.2	+43.57	3 17.40	0.248	2 47 39.64
Sat.	5	2 48 13.12	9.631	16 12 10.0	42.90	3 23.08	0.225	2 51 36.20
SUN.	6	2 52 4.55	9.654	16 29 11.6	42.22	3 28.21	0.202	2 55 32.76
Mon.	7	2 55 56.52	9.677	16 45 56.8	+41.53	3 32.79	0.179	2 59 29.31
Tues.	8	2 59 49.03	9.700	17 2 25.2	40.83	3 36.83	0.156	3 3 25.86
Wed.	9	3 3 42.11	9.723	17 18 36.5	40.11	3 40.31	0.133	3 7 22.42
Thur.	10	3 7 35.74	9.746	17 34 30.5	+39.38	3 43.24	0.110	3 11 18.98
Frid.	11	3 11 29.93	9.770	17 50 6.8	38.64	3 45.60	0.087	3 15 15.53
Sat.	12	3 15 24.68	9.793	18 5 25.3	37.89	3 47.40	0.063	3 19 12.09
SUN.	13	3 19 20.00	9.817	18 20 25.5	+37.13	3 48.64	0.039	3 23 8.64
Mon.	14	3 23 15.89	9.840	18 35 7.3	36.36	3 49.30	0.015	3 27 5.20
Tues.	15	3 27 12.35	9.864	18 49 30.3	35.57	3 49.40	0.009	3 31 1.75
Wed.	16	3 31 9.38	9.888	19 3 34.3	+34.77	3 48.92	0.032	3 34 58.31
Thur.	17	3 35 6.99	9.912	19 17 19.0	33.96	3 47.88	0.056	3 38 54.86
Frid.	18	3 39 5.17	9.936	19 30 44.2	33.14	3 46.25	0.080	3 42 51.42
Sat.	19	3 43 3.92	9.960	19 43 49.6	+32.31	3 44.06	0.104	3 46 47.98
SUN.	20	3 47 3.24	9.984	19 56 34.9	31.47	3 41.29	0.127	3 50 44.53
Mon.	21	3 51 3.13	10.007	20 8 59.9	30.61	3 37.96	0.150	3 54 41.09
Tues.	22	3 55 3.57	10.030	20 21 4.2	+29.74	3 34.08	0.173	3 58 37.65
Wed.	23	3 59 4.57	10.053	20 32 47.8	28.87	3 29.64	0.195	4 2 34.20
Thur.	24	4 3 6.11	10.075	20 44 10.2	27.99	3 24.65	0.217	4 6 30.76
Frid.	25	4 7 8.17	10.097	20 55 11.3	+27.09	3 19.14	0.239	4 10 27.32
Sat.	26	4 11 10.75	10.118	21 5 50.8	26.19	3 13.12	0.261	4 14 23.87
SUN.	27	4 15 13.84	10.138	21 16 8.5	25.28	3 6.59	0.282	4 18 20.43
Mon.	28	4 19 17.40	10.158	21 26 4.2	+24.36	2 59.58	0.303	4 22 16.98
Tues.	29	4 23 21.43	10.177	21 35 37.7	23.43	2 52.11	0.322	4 26 13.54
Wed.	30	4 27 25.90	10.195	21 44 48.7	22.49	2 44.19	0.340	4 30 10.10
Thur.	31	4 31 30.80	10.212	21 53 37.0	21.54	2 35.85	0.357	4 34 6.66
Frid.	32	4 35 36.12	10.229	N.22 2 2.5	+20.58	2 27.10	0.373	4 38 3.21

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE.		THE SUN'S Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		λ	λ'					
		° ′ ″	′ ″	″	″			h m s
1	121	40 38 54.0	38 22.0	145.54	+ 0.26	0.0034818	+44.5	21 20 39.64
2	122	41 37 5.9	36 33.7	145.46	0.13	0.0035879	43.9	21 16 43.73
3	123	42 35 15.9	34 43.6	145.37	+ 0.01	0.0036926	43.3	21 12 47.82
4	124	43 33 23.9	32 51.4	145.29	— 0.11	0.0037957	+42.7	21 8 51.91
5	125	44 31 30.0	30 57.4	145.21	0.20	0.0038975	42.1	21 4 56.00
6	126	45 29 34.2	29 1.5	145.13	0.27	0.0039980	41.6	21 1 0.10
7	127	46 27 36.5	27 3.6	145.05	— 0.33	0.0040973	+41.1	20 57 4.19
8	128	47 25 36.8	25 3.8	144.97	0.35	0.0041955	40.7	20 53 8.28
9	129	48 23 35.4	23 2.3	144.90	0.34	0.0042926	40.3	20 49 12.37
10	130	49 21 32.1	20 58.8	144.83	— 0.31	0.0043888	+39.9	20 45 16.46
11	131	50 19 27.1	18 53.7	144.76	0.24	0.0044839	39.5	20 41 20.55
12	132	51 17 20.4	16 46.8	144.69	0.16	0.0045782	39.1	20 37 24.64
13	133	52 15 12.1	14 38.4	144.62	— 0.06	0.0046716	+38.7	20 33 28.73
14	134	53 13 2.2	12 28.3	144.56	+ 0.05	0.0047642	38.3	20 29 32.82
15	135	54 10 50.8	10 16.8	144.50	0.18	0.0048559	38.0	20 25 36.91
16	136	55 8 38.0	8 3.9	144.44	+ 0.32	0.0049468	+37.6	20 21 41.00
17	137	56 6 23.9	5 49.6	144.39	0.45	0.0050367	37.2	20 17 45.09
18	138	57 4 8.6	3 34.2	144.34	0.57	0.0051257	36.8	20 13 49.18
19	139	58 1 52.1	1 17.5	144.29	+ 0.67	0.0052137	+36.4	20 9 53.27
20	140	58 59 34.5	58 59.8	144.24	0.75	0.0053004	35.8	20 5 57.36
21	141	59 57 15.9	56 41.1	144.20	0.79	0.0053857	35.2	20 2 1.45
22	142	60 54 56.3	54 21.3	144.16	+ 0.79	0.0054696	+34.5	19 58 5.54
23	143	61 52 35.7	52 0.6	144.12	0.77	0.0055517	33.8	19 54 9.63
24	144	62 50 14.2	49 38.9	144.08	0.71	0.0056320	33.0	19 50 13.72
25	145	63 47 51.7	47 16.2	144.04	+ 0.62	0.0057103	+32.1	19 46 17.81
26	146	64 45 28.2	44 52.6	144.00	0.52	0.0057864	31.2	19 42 21.90
27	147	65 43 3.8	42 28.0	143.96	0.39	0.0058602	30.3	19 38 25.99
28	148	66 40 38.2	40 2.2	143.91	+ 0.26	0.0059318	+29.4	19 34 30.08
29	149	67 38 11.5	37 35.4	143.86	+ 0.12	0.0060010	28.4	19 30 34.16
30	150	68 35 43.7	35 7.4	143.82	— 0.02	0.0060678	27.4	19 26 38.25
31	151	69 33 14.7	32 38.3	143.77	0.14	0.0061324	26.3	19 22 42.34
32	152	70 30 44.5	30 7.9	143.72	— 0.24	0.0061947	+25.4	19 18 46.43

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ' to the mean equinox of January 0.^{d}0.

Diff. for 1 Hour,
—9^s.8296.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 56.3	15 49.3	58 23.1	−2.09	57 57.5	−2.15	2 5.5	2.40	2.3
2	15 42.2	15 35.2	57 31.4	2.16	57 5.5	2.13	3 2.2	2.31	3.3
3	15 28.3	15 21.7	56 40.2	2.06	56 15.9	1.95	3 56.2	2.18	4.3
4	15 15.5	15 9.8	55 53.2	−1.82	55 32.2	−1.66	4 46.9	2.04	5.3
5	15 4.6	15 0.1	55 13.3	1.48	54 56.6	1.29	5 34.3	1.91	6.3
6	14 56.2	14 53.0	54 42.4	1.08	54 30.6	0.87	6 18.8	1.81	7.3
7	14 50.5	14 48.7	54 21.4	−0.66	54 14.7	−0.45	7 1.2	1.74	8.3
8	14 47.6	14 47.1	54 10.6	−0.24	54 8.9	−0.04	7 42.5	1.71	9.3
9	14 47.3	14 48.1	54 9.6	+0.15	54 12.6	+0.33	8 23.5	1.72	10.3
10	14 49.5	14 51.4	54 17.7	+0.50	54 24.7	+0.65	9 5.2	1.76	11.3
11	14 53.8	14 56.6	54 33.4	0.79	54 43.8	0.92	9 48.3	1.84	12.3
12	14 59.8	15 3.2	54 55.4	1.02	55 8.2	1.10	10 33.6	1.94	13.3
13	15 7.0	15 10.9	55 22.0	+1.18	55 36.4	+1.23	11 21.5	2.06	14.3
14	15 15.0	15 19.2	55 51.4	1.26	56 6.7	1.28	12 12.4	2.17	15.3
15	15 23.4	15 27.6	56 22.1	1.29	56 37.6	1.28	13 5.6	2.26	16.3
16	15 31.7	15 35.9	56 52.9	+1.27	57 8.0	+1.24	14 0.5	2.30	17.3
17	15 39.9	15 43.8	57 22.8	1.21	57 37.2	1.18	14 55.8	2.29	18.3
18	15 47.6	15 51.3	57 51.1	1.14	58 4.6	1.10	15 50.4	2.25	19.3
19	15 54.8	15 58.2	58 17.6	+1.05	58 30.0	+1.01	16 43.6	2.19	20.3
20	16 1.4	16 4.4	58 41.8	0.95	58 52.9	0.89	17 35.4	2.13	21.3
21	16 7.2	16 9.8	59 3.3	0.82	59 12.7	0.74	18 26.3	2.11	22.3
22	16 12.1	16 14.0	59 21.0	+0.64	59 28.0	+0.53	19 16.8	2.11	23.3
23	16 15.5	16 16.6	59 33.6	0.39	59 37.5	+0.25	20 8.0	2.16	24.3
24	16 17.1	16 17.1	59 39.5	+0.08	59 39.4	−0.10	21 0.7	2.23	25.3
25	16 16.4	16 15.1	59 37.0	−0.30	59 32.2	−0.50	21 55.4	2.32	26.3
26	16 13.2	16 10.5	59 25.0	0.71	59 15.1	0.92	22 52.0	2.39	27.3
27	16 7.1	16 3.2	59 2.9	1.11	58 48.4	1.30	23 49.8	2.42	28.3
28	15 58.7	15 53.7	58 31.8	−1.46	58 13.4	−1.59	☌		29.3
29	15 48.2	15 42.6	57 53.5	1.69	57 32.6	1.77	0 47.4	2.37	0.9
30	15 36.7	15 30.8	57 11.1	1.80	56 49.3	1.80	1 43.3	2.28	1.9
31	15 24.9	15 19.2	56 27.7	1.77	56 6.8	1.70	2 36.3	2.14	2.9
32	15 13.7	15 8.7	55 46.8	−1.61	55 28.1	−1.49	3 25.9	2.00	3.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 1.					THURSDAY 3.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 36 29.81	2.4803	N.22 6 23.4	1.770	0	6 31 37.36	2.2913	N.20 56 17.9	4.414
1	4 38 58.57	2.4782	22 8 5.3	1.627	1	6 33 54.68	2.2860	20 51 49.8	4.523
2	4 41 27.20	2.4760	22 9 38.7	1.486	2	6 36 11.68	2.2807	20 47 15.2	4.631
3	4 43 55.69	2.4736	22 11 3.6	1.343	3	6 38 28.37	2.2755	20 42 34.1	4.738
4	4 46 24.03	2.4712	22 12 19.9	1.201	4	6 40 44.74	2.2702	20 37 46.7	4.843
5	4 48 52.23	2.4687	22 13 27.7	1.059	5	6 43 0.80	2.2649	20 32 53.0	4.948
6	4 51 20.28	2.4662	22 14 27.0	0.918	6	6 45 16.53	2.2596	20 27 53.0	5.052
7	4 53 48.17	2.4634	22 15 17.9	0.778	7	6 47 31.95	2.2542	20 22 46.8	5.154
8	4 56 15.89	2.4606	22 16 0.4	0.638	8	6 49 47.04	2.2488	20 17 34.5	5.255
9	4 58 43.44	2.4577	22 16 34.5	0.498	9	6 52 1.81	2.2435	20 12 16.2	5.356
10	5 1 10.82	2.4548	22 17 0.2	0.359	10	6 54 16.26	2.2381	20 6 51.8	5.456
11	5 3 38.02	2.4517	22 17 17.6	0.220	11	6 56 30.38	2.2327	20 1 21.5	5.554
12	5 6 5.02	2.4485	22 17 26.6	+ 0.082	12	6 58 44.18	2.2273	19 55 45.3	5.652
13	5 8 31.84	2.4454	22 17 27.4	− 0.056	13	7 0 57.66	2.2219	19 50 3.3	5.749
14	5 10 58.47	2.4421	22 17 19.9	0.193	14	7 3 10.81	2.2164	19 44 15.4	5.845
15	5 13 24.89	2.4387	22 17 4.2	0.330	15	7 5 23.63	2.2110	19 38 21.9	5.939
16	5 15 51.11	2.4352	22 16 40.3	0.466	16	7 7 36.13	2.2057	19 32 22.7	6.033
17	5 18 17.12	2.4317	22 16 8.3	0.601	17	7 9 48.31	2.2003	19 26 18.0	6.125
18	5 20 42.92	2.4282	22 15 28.2	0.736	18	7 12 0.17	2.1949	19 20 7.7	6.218
19	5 23 8.50	2.4244	22 14 40.0	0.870	19	7 14 11.70	2.1894	19 13 51.9	6.308
20	5 25 33.85	2.4206	22 13 43.8	1.003	20	7 16 22.90	2.1841	19 7 30.7	6.398
21	5 27 58.97	2.4167	22 12 39.6	1.137	21	7 18 33.79	2.1787	19 1 4.2	6.486
22	5 30 23.86	2.4128	22 11 27.4	1.268	22	7 20 44.35	2.1732	18 54 32.4	6.574
23	5 32 48.51	2.4089	N.22 10 7.4	1.400	23	7 22 54.58	2.1679	N.18 47 55.3	6.661
WEDNESDAY 2.					FRIDAY 4.				
0	5 35 12.93	2.4048	N.22 8 39.4	1.531	0	7 25 4.50	2.1626	N.18 41 13.1	6.746
1	5 37 37.09	2.4007	22 7 3.7	1.660	1	7 27 14.09	2.1572	18 34 25.8	6.831
2	5 40 1.01	2.3965	22 5 20.2	1.789	2	7 29 23.36	2.1519	18 27 33.4	6.915
3	5 42 24.67	2.3922	22 3 29.0	1.918	3	7 31 32.32	2.1466	18 20 36.0	6.998
4	5 44 48.08	2.3880	22 1 30.0	2.046	4	7 33 40.95	2.1412	18 13 33.6	7.080
5	5 47 11.23	2.3836	21 59 23.5	2.172	5	7 35 49.27	2.1360	18 6 26.4	7.160
6	5 49 34.11	2.3791	21 57 9.4	2.298	6	7 37 57.27	2.1307	17 59 14.4	7.240
7	5 51 56.72	2.3747	21 54 47.8	2.423	7	7 40 4.95	2.1254	17 51 57.6	7.319
8	5 54 19.07	2.3702	21 52 18.6	2.548	8	7 42 12.32	2.1202	17 44 36.1	7.398
9	5 56 41.14	2.3655	21 49 42.1	2.670	9	7 44 19.38	2.1150	17 37 9.9	7.474
10	5 59 2.93	2.3608	21 46 58.2	2.793	10	7 46 26.12	2.1098	17 29 39.2	7.550
11	6 1 24.44	2.3562	21 44 6.9	2.916	11	7 48 32.55	2.1047	17 22 3.9	7.626
12	6 3 45.67	2.3514	21 41 8.3	3.037	12	7 50 38.68	2.0996	17 14 24.1	7.700
13	6 6 6.61	2.3466	21 38 2.5	3.156	13	7 52 44.50	2.0944	17 6 39.9	7.773
14	6 8 27.26	2.3417	21 34 49.6	3.275	14	7 54 50.01	2.0893	16 58 51.4	7.844
15	6 10 47.62	2.3369	21 31 29.5	3.393	15	7 56 55.22	2.0842	16 50 58.5	7.916
16	6 13 7.69	2.3320	21 28 2.4	3.510	16	7 59 0.12	2.0792	16 43 1.4	7.987
17	6 15 27.46	2.3270	21 24 28.3	3.627	17	8 1 4.73	2.0743	16 35 0.1	8.056
18	6 17 46.93	2.3220	21 20 47.2	3.743	18	8 3 9.04	2.0693	16 26 54.7	8.124
19	6 20 6.10	2.3170	21 16 59.2	3.857	19	8 5 13.05	2.0644	16 18 45.2	8.193
20	6 22 24.97	2.3119	21 13 4.4	3.970	20	8 7 16.77	2.0596	16 10 31.6	8.259
21	6 24 43.53	2.3067	21 9 2.8	4.083	21	8 9 20.20	2.0547	16 2 14.1	8.325
22	6 27 1.78	2.3016	21 4 54.5	4.194	22	8 11 23.33	2.0498	15 53 52.6	8.390
23	6 29 19.72	2.2965	21 0 39.5	4.305	23	8 13 26.18	2.0451	15 45 27.3	8.454
24	6 31 37.36	2.2913	N.20 56 17.9	4.414	24	8 15 28.74	2.0403	N.15 36 58.1	8.518

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 5.					MONDAY 7.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 15 28.74	2.0403	N.15 36 58.1	8.518	0	9 48 48.86	1.8683	N. 7 50 45.6	10.622
1	8 17 31.02	2.0357	15 28 25.2	8.579	1	9 50 40.89	1.8661	7 40 7.5	10.648
2	8 19 33.02	2.0310	15 19 48.6	8.641	2	9 52 32.79	1.8638	7 29 27.8	10.674
3	8 21 34.74	2.0263	15 11 8.3	8.702	3	9 54 24.55	1.8617	7 18 46.6	10.699
4	8 23 36.18	2.0217	15 2 24.4	8.761	4	9 56 16.19	1.8596	7 8 3.9	10.724
5	8 25 37.35	2.0172	14 53 37.0	8.820	5	9 58 7.70	1.8576	6 57 19.7	10.748
6	8 27 38.24	2.0127	14 44 46.0	8.878	6	9 59 59.10	1.8557	6 46 34.1	10.772
7	8 29 38.87	2.0082	14 35 51.6	8.935	7	10 1 50.38	1.8537	6 35 47.1	10.795
8	8 31 39.23	2.0038	14 26 53.8	8.992	8	10 3 41.54	1.8518	6 24 58.7	10.817
9	8 33 39.33	1.9995	14 17 52.6	9.048	9	10 5 32.60	1.8501	6 14 9.1	10.838
10	8 35 39.17	1.9952	14 8 48.1	9.103	10	10 7 23.55	1.8483	6 3 18.2	10.859
11	8 37 38.75	1.9908	13 59 40.3	9.156	11	10 9 14.40	1.8467	5 52 26.0	10.880
12	8 39 38.07	1.9866	13 50 29.4	9.208	12	10 11 5.15	1.8451	5 41 32.6	10.899
13	8 41 37.14	1.9824	13 41 15.3	9.261	13	10 12 55.81	1.8435	5 30 38.1	10.918
14	8 43 35.96	1.9783	13 31 58.1	9.313	14	10 14 46.37	1.8419	5 19 42.4	10.937
15	8 45 34.54	1.9742	13 22 37.8	9.363	15	10 16 36.84	1.8405	5 8 45.6	10.955
16	8 47 32.87	1.9701	13 13 14.5	9.413	16	10 18 27.23	1.8392	4 57 47.8	10.972
17	8 49 30.95	1.9661	13 3 48.3	9.462	17	10 20 17.54	1.8378	4 46 49.0	10.988
18	8 51 28.80	1.9622	12 54 19.1	9.510	18	10 22 7.77	1.8366	4 35 49.2	11.005
19	8 53 26.42	1.9583	12 44 47.1	9.558	19	10 23 57.93	1.8354	4 24 48.4	11.021
20	8 55 23.80	1.9544	12 35 12.2	9.605	20	10 25 48.02	1.8342	4 13 46.7	11.036
21	8 57 20.95	1.9506	12 25 34.5	9.651	21	10 27 38.03	1.8331	4 2 44.1	11.050
22	8 59 17.87	1.9468	12 15 54.1	9.696	22	10 29 27.99	1.8322	3 51 40.7	11.064
23	9 1 14.57	1.9432	N.12 6 11.0	9.740	23	10 31 17.89	1.8311	N. 3 40 36.4	11.077
SUNDAY 6.					TUESDAY 8.				
0	9 3 11.05	1.9395	N.11 56 25.3	9.783	0	10 33 7.72	1.8301	N. 3 29 31.4	11.089
1	9 5 7.31	1.9359	11 46 37.0	9.827	1	10 34 57.50	1.8293	3 18 25.7	11.102
2	9 7 3.36	1.9324	11 36 46.1	9.869	2	10 36 47.24	1.8286	3 7 19.2	11.113
3	9 8 59.20	1.9289	11 26 52.7	9.911	3	10 38 36.93	1.8278	2 56 12.1	11.123
4	9 10 54.83	1.9255	11 16 56.8	9.952	4	10 40 26.58	1.8272	2 45 4.4	11.133
5	9 12 50.26	1.9221	11 6 58.5	9.992	5	10 42 16.19	1.8265	2 33 56.1	11.143
6	9 14 45.48	1.9187	10 56 57.8	10.031	6	10 44 5.76	1.8259	2 22 47.2	11.153
7	9 16 40.51	1.9155	10 46 54.7	10.069	7	10 45 55.30	1.8255	2 11 37.7	11.162
8	9 18 35.34	1.9123	10 36 49.4	10.108	8	10 47 44.82	1.8251	2 0 27.8	11.168
9	9 20 29.98	1.9091	10 26 41.8	10.145	9	10 49 34.31	1.8247	1 49 17.5	11.176
10	9 22 24.43	1.9060	10 16 32.0	10.182	10	10 51 23.78	1.8243	1 38 6.7	11.183
11	9 24 18.70	1.9030	10 6 20.0	10.218	11	10 53 13.23	1.8241	1 26 55.4	11.189
12	9 26 12.79	1.9000	9 56 5.9	10.253	12	10 55 2.67	1.8238	1 15 43.9	11.194
13	9 28 6.70	1.8970	9 45 49.7	10.287	13	10 56 52.09	1.8237	1 4 32.1	11.199
14	9 30 0.43	1.8941	9 35 31.5	10.320	14	10 58 41.51	1.8237	0 53 20.0	11.204
15	9 31 53.99	1.8912	9 25 11.3	10.352	15	11 0 30.93	1.8236	0 42 7.6	11.208
16	9 33 47.38	1.8885	9 14 49.1	10.386	16	11 2 20.34	1.8236	0 30 55.1	11.210
17	9 35 40.61	1.8857	9 4 25.0	10.418	17	11 4 9.76	1.8237	0 19 42.4	11.213
18	9 37 33.67	1.8831	8 53 59.0	10.448	18	11 5 59.18	1.8239	N. 0 8 29.5	11.215
19	9 39 26.58	1.8805	8 43 31.2	10.479	19	11 7 48.62	1.8241	S. 0 2 43.4	11.216
20	9 41 19.33	1.8779	8 33 1.5	10.509	20	11 9 38.07	1.8243	0 13 56.4	11.218
21	9 43 11.93	1.8754	8 22 30.1	10.538	21	11 11 27.54	1.8247	0 25 9.5	11.218
22	9 45 4.38	1.8730	8 11 56.9	10.567	22	11 13 17.03	1.8250	0 36 22.5	11.217
23	9 46 56.69	1.8707	8 1 22.1	10.594	23	11 15 6.54	1.8255	0 47 35.5	11.217
24	9 48 48.86	1.8683	N. 7 50 45.6	10.622	24	11 16 56.09	1.8260	S. 0 58 48.5	11.215

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 9.					**FRIDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 16 56.09	1.8260	S. 0 58 48.5	11.215	0	12 46 12.74	1.9144	S. 9 43 19.8	10.383
1	11 18 45.66	1.8265	1 10 1.3	11.212	1	12 48 7.70	1.9176	9 53 41.7	10.348
2	11 20 35.27	1.8272	1 21 13.9	11.209	2	12 50 2.85	1.9207	10 4 1.6	10.313
3	11 22 24.92	1.8278	1 32 26.4	11.207	3	12 51 58.18	1.9238	10 14 19.3	10.278
4	11 24 14.61	1.8285	1 43 38.7	11.203	4	12 53 53.71	1.9272	10 24 34.9	10.241
5	11 26 4.34	1.8293	1 54 50.7	11.198	5	12 55 49.44	1.9304	10 34 48.2	10.203
6	11 27 54.12	1.8302	2 6 2.4	11.193	6	12 57 45.36	1.9337	10 44 59.2	10.164
7	11 29 43.96	1.8311	2 17 13.8	11.187	7	12 59 41.48	1.9370	10 55 7.9	10.125
8	11 31 33.85	1.8320	2 28 24.8	11.180	8	13 1 37.80	1.9404	11 5 14.2	10.085
9	11 33 23.80	1.8330	2 39 35.4	11.173	9	13 3 34.33	1.9439	11 15 18.1	10.044
10	11 35 13.81	1.8341	2 50 45.6	11.166	10	13 5 31.07	1.9474	11 25 19.5	10.002
11	11 37 3.89	1.8352	3 1 55.3	11.158	11	13 7 28.02	1.9509	11 35 18.3	9.959
12	11 38 54.03	1.8363	3 13 4.5	11.148	12	13 9 25.18	1.9545	11 45 14.7	9.917
13	11 40 44.25	1.8376	3 24 13.1	11.138	13	13 11 22.56	1.9581	11 55 8.4	9.873
14	11 42 34.54	1.8388	3 35 21.1	11.128	14	13 13 20.15	1.9617	12 4 59.4	9.828
15	11 44 24.91	1.8402	3 46 28.5	11.118	15	13 15 17.96	1.9654	12 14 47.7	9.782
16	11 46 15.37	1.8417	3 57 35.3	11.107	16	13 17 16.00	1.9692	12 24 33.2	9.734
17	11 48 5.91	1.8431	4 8 41.3	11.094	17	13 19 14.26	1.9729	12 34 15.8	9.687
18	11 49 56.54	1.8446	4 19 46.6	11.082	18	13 21 12.75	1.9767	12 43 55.6	9.639
19	11 51 47.26	1.8462	4 30 51.1	11.068	19	13 23 11.47	1.9805	12 53 32.5	9.590
20	11 53 38.08	1.8477	4 41 54.8	11.054	20	13 25 10.41	1.9843	13 3 6.4	9.540
21	11 55 28.99	1.8494	4 52 57.6	11.040	21	13 27 9.59	1.9883	13 12 37.3	9.489
22	11 57 20.01	1.8512	5 3 59.6	11.025	22	13 29 9.01	1.9922	13 22 5.1	9.438
23	11 59 11.13	1.8530	S. 5 15 0.6	11.008	23	13 31 8.66	1.9962	S. 13 31 29.8	9.384
	THURSDAY 10.					**SATURDAY 12.**			
0	12 1 2.37	1.8549	S. 5 26 0.6	10.992	0	13 33 8.55	2.0002	S. 13 40 51.2	9.330
1	12 2 53.72	1.8567	5 36 59.6	10.974	1	13 35 8.68	2.0042	13 50 9.4	9.277
2	12 4 45.18	1.8586	5 47 57.5	10.956	2	13 37 9.06	2.0083	13 59 24.4	9.222
3	12 6 36.75	1.8606	5 58 54.3	10.938	3	13 39 9.68	2.0124	14 8 36.0	9.166
4	12 8 28.45	1.8627	6 9 50.0	10.918	4	13 41 10.55	2.0165	14 17 44.3	9.109
5	12 10 20.28	1.8648	6 20 44.5	10.898	5	13 43 11.66	2.0206	14 26 49.1	9.051
6	12 12 12.23	1.8669	6 31 37.8	10.878	6	13 45 13.02	2.0248	14 35 50.4	8.992
7	12 14 4.31	1.8692	6 42 29.8	10.856	7	13 47 14.64	2.0291	14 44 48.1	8.932
8	12 15 56.53	1.8715	6 53 20.5	10.834	8	13 49 16.51	2.0333	14 53 42.2	8.872
9	12 17 48.89	1.8737	7 4 9.9	10.812	9	13 51 18.63	2.0375	15 2 32.7	8.810
10	12 19 41.38	1.8761	7 14 57.9	10.788	10	13 53 21.01	2.0418	15 11 19.4	8.748
11	12 21 34.02	1.8785	7 25 44.5	10.763	11	13 55 23.65	2.0461	15 20 2.4	8.684
12	12 23 26.80	1.8809	7 36 29.5	10.738	12	13 57 26.54	2.0503	15 28 41.5	8.620
13	12 25 19.73	1.8835	7 47 13.1	10.713	13	13 59 29.69	2.0547	15 37 16.8	8.555
14	12 27 12.82	1.8862	7 57 55.1	10.687	14	14 1 33.10	2.0591	15 45 48.1	8.488
15	12 29 6.07	1.8887	8 8 35.5	10.660	15	14 3 36.78	2.0635	15 54 15.4	8.422
16	12 30 59.47	1.8913	8 19 14.3	10.633	16	14 5 40.72	2.0679	16 2 38.7	8.354
17	12 32 53.03	1.8941	8 29 51.4	10.603	17	14 7 44.93	2.0723	16 10 57.9	8.285
18	12 34 46.76	1.8968	8 40 26.7	10.574	18	14 9 49.40	2.0767	16 19 12.9	8.215
19	12 36 40.65	1.8997	8 51 0.3	10.544	19	14 11 54.13	2.0811	16 27 23.7	8.145
20	12 38 34.72	1.9026	9 1 32.0	10.513	20	14 13 59.13	2.0856	16 35 30.3	8.073
21	12 40 28.96	1.9054	9 12 1.9	10.482	21	14 16 4.40	2.0901	16 43 32.5	8.001
22	12 42 23.37	1.9084	9 22 29.8	10.449	22	14 18 9.94	2.0946	16 51 30.4	7.928
23	12 44 17.97	1.9114	9 32 55.8	10.417	23	14 20 15.75	2.0991	16 59 23.8	7.853
24	12 46 12.74	1.9144	S. 9 43 19.8	10.383	24	14 22 21.83	2.1036	S. 17 7 12.7	7.778

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
SUNDAY 13.								
	h	m	s	s	°	′	″	″
0	14	22	21.83	2.1036	S.17	7	12.7	7.778
1	14	24	28.18	2.1081	17	14	57.1	7.702
2	14	26	34.80	2.1126	17	22	36.9	7.624
3	14	28	41.69	2.1171	17	30	12.0	7.545
4	14	30	48.85	2.1216	17	37	42.3	7.466
5	14	32	56.28	2.1262	17	45	7.9	7.387
6	14	35	3.99	2.1307	17	52	28.7	7.306
7	14	37	11.97	2.1352	17	59	44.6	7.223
8	14	39	20.22	2.1398	18	6	55.5	7.141
9	14	41	28.74	2.1442	18	14	1.5	7.058
10	14	43	37.53	2.1487	18	21	2.4	6.973
11	14	45	46.59	2.1532	18	27	58.3	6.887
12	14	47	55.92	2.1577	18	34	48.9	6.800
13	14	50	5.52	2.1623	18	41	34.3	6.713
14	14	52	15.40	2.1668	18	48	14.4	6.624
15	14	54	25.54	2.1712	18	54	49.2	6.535
16	14	56	35.95	2.1757	19	1	18.6	6.445
17	14	58	46.63	2.1802	19	7	42.6	6.354
18	15	0	57.58	2.1847	19	14	1.1	6.262
19	15	3	8.79	2.1891	19	20	14.0	6.168
20	15	5	20.27	2.1935	19	26	21.3	6.074
21	15	7	32.01	2.1978	19	32	22.9	5.979
22	15	9	44.01	2.2023	19	38	18.8	5.884
23	15	11	56.28	2.2067	S.19	44	9.0	5.788
MONDAY 14.								
0	15	14	8.81	2.2110	S.19	49	53.3	5.690
1	15	16	21.60	2.2153	19	55	31.8	5.592
2	15	18	34.64	2.2195	20	1	4.3	5.493
3	15	20	47.94	2.2238	20	6	30.9	5.393
4	15	23	1.50	2.2281	20	11	51.4	5.291
5	15	25	15.31	2.2322	20	17	5.8	5.189
6	15	27	29.37	2.2364	20	22	14.1	5.087
7	15	29	43.68	2.2405	20	27	16.2	4.983
8	15	31	58.23	2.2446	20	32	12.1	4.879
9	15	34	13.03	2.2488	20	37	1.7	4.773
10	15	36	28.08	2.2527	20	41	44.9	4.668
11	15	38	43.36	2.2567	20	46	21.8	4.561
12	15	40	58.88	2.2607	20	50	52.2	4.453
13	15	43	14.64	2.2646	20	55	16.2	4.345
14	15	45	30.63	2.2684	20	59	33.6	4.235
15	15	47	46.85	2.2722	21	3	44.4	4.125
16	15	50	3.30	2.2761	21	7	48.6	4.015
17	15	52	19.98	2.2798	21	11	46.2	3.903
18	15	54	36.88	2.2835	21	15	37.0	3.791
19	15	56	54.00	2.2871	21	19	21.1	3.678
20	15	59	11.33	2.2907	21	22	58.4	3.564
21	16	1	28.88	2.2942	21	26	28.8	3.450
22	16	3	46.64	2.2977	21	29	52.4	3.335
23	16	6	4.60	2.3010	21	33	9.1	3.218
24	16	8	22.76	2.3044	S.21	36	18.7	3.102

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
TUESDAY 15.								
	h	m	s	s	°	′	″	″
0	16	8	22.76	2.3044	S.21	36	18.7	3.102
1	16	10	41.13	2.3077	21	39	21.3	2.985
2	16	12	59.70	2.3110	21	42	16.9	2.868
3	16	15	18.45	2.3142	21	45	5.4	2.749
4	16	17	37.40	2.3174	21	47	46.8	2.630
5	16	19	56.54	2.3205	21	50	21.0	2.510
6	16	22	15.86	2.3235	21	52	48.0	2.390
7	16	24	35.36	2.3264	21	55	7.8	2.269
8	16	26	55.03	2.3292	21	57	20.3	2.148
9	16	29	14.87	2.3321	21	59	25.5	2.026
10	16	31	34.88	2.3349	22	1	23.4	1.903
11	16	33	55.06	2.3376	22	3	13.9	1.780
12	16	36	15.39	2.3402	22	4	57.0	1.657
13	16	38	35.88	2.3427	22	6	32.7	1.533
14	16	40	56.52	2.3452	22	8	0.9	1.408
15	16	43	17.31	2.3477	22	9	21.6	1.283
16	16	45	38.25	2.3501	22	10	34.8	1.158
17	16	47	59.32	2.3522	22	11	40.5	1.032
18	16	50	20.52	2.3544	22	12	38.6	0.905
19	16	52	41.85	2.3566	22	13	29.1	0.778
20	16	55	3.31	2.3587	22	14	12.0	0.652
21	16	57	24.89	2.3606	22	14	47.3	0.524
22	16	59	46.58	2.3625	22	15	14.9	0.397
23	17	2	8.39	2.3643	S.22	15	34.9	0.269
WEDNESDAY 16.								
0	17	4	30.30	2.3661	S.22	15	47.2	0.141
1	17	6	52.32	2.3677	22	15	51.8	− 0.012
2	17	9	14.43	2.3693	22	15	48.6	+ 0.118
3	17	11	36.64	2.3709	22	15	37.7	0.247
4	17	13	58.94	2.3723	22	15	19.0	0.376
5	17	16	21.32	2.3737	22	14	52.6	0.506
6	17	18	43.78	2.3749	22	14	18.3	0.636
7	17	21	6.31	2.3761	22	13	36.3	0.765
8	17	23	28.91	2.3773	22	12	46.5	0.895
9	17	25	51.58	2.3783	22	11	48.9	1.026
10	17	28	14.31	2.3793	22	10	43.4	1.156
11	17	30	37.10	2.3802	22	9	30.2	1.286
12	17	32	59.93	2.3809	22	8	9.1	1.417
13	17	35	22.81	2.3817	22	6	40.2	1.548
14	17	37	45.74	2.3824	22	5	3.4	1.678
15	17	40	8.70	2.3830	22	3	18.8	1.808
16	17	42	31.70	2.3835	22	1	26.4	1.939
17	17	44	54.72	2.3839	21	59	26.1	2.070
18	17	47	17.77	2.3843	21	57	18.0	2.200
19	17	49	40.84	2.3846	21	55	2.1	2.331
20	17	52	3.92	2.3847	21	52	38.3	2.462
21	17	54	27.01	2.3849	21	50	6.7	2.592
22	17	56	50.11	2.3850	21	47	27.3	2.722
23	17	59	13.21	2.3850	21	44	40.1	2.852
24	18	1	36.31	2.3849	S.21	41	45.1	2.982

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 17.					**SATURDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 1 36.31	2.3849	S.21 41 45.1	2.982	0	19 54 48.09	2.3139	S.16 56 9.3	8.695
1	18 3 59.40	2.3847	21 38 42.3	3.112	1	19 57 6.86	2.3116	16 47 24.4	8.797
2	18 6 22.47	2.3844	21 35 31.7	3.242	2	19 59 25.48	2.3092	16 38 33.6	8.898
3	18 8 45.53	2.3842	21 32 13.3	3.371	3	20 1 43.97	2.3069	16 29 36.7	8.998
4	18 11 8.57	2.3837	21 28 47.2	3.500	4	20 4 2.31	2.3046	16 20 33.8	9.098
5	18 13 31.58	2.3833	21 25 13.3	3.629	5	20 6 20.52	2.3022	16 11 25.0	9.196
6	18 15 54.56	2.3827	21 21 31.7	3.758	6	20 8 38.58	2.2998	16 2 10.3	9.293
7	18 18 17.51	2.3823	21 17 42.4	3.886	7	20 10 56.50	2.2975	15 52 49.8	9.389
8	18 20 40.43	2.3816	21 13 45.4	4.013	8	20 13 14.28	2.2952	15 43 23.6	9.484
9	18 23 3.30	2.3808	21 9 40.8	4.141	9	20 15 31.92	2.2928	15 33 51.7	9.579
10	18 25 26.13	2.3801	21 5 28.5	4.268	10	20 17 49.42	2.2905	15 24 14.1	9.673
11	18 27 48.91	2.3792	21 1 8.6	4.396	11	20 20 6.78	2.2881	15 14 30.9	9.766
12	18 30 11.63	2.3782	20 56 41.0	4.523	12	20 22 23.99	2.2857	15 4 42.2	9.858
13	18 32 34.30	2.3773	20 52 5.9	4.648	13	20 24 41.07	2.2834	14 54 48.0	9.948
14	18 34 56.91	2.3762	20 47 23.2	4.775	14	20 26 58.00	2.2810	14 44 48.5	10.037
15	18 37 19.45	2.3752	20 42 32.9	4.900	15	20 29 14.79	2.2787	14 34 43.6	10.125
16	18 39 41.93	2.3740	20 37 35.2	5.024	16	20 31 31.45	2.2765	14 24 33.5	10.213
17	18 42 4.33	2.3727	20 32 30.0	5.149	17	20 33 47.97	2.2742	14 14 18.1	10.299
18	18 44 26.66	2.3715	20 27 17.3	5.273	18	20 36 4.35	2.2719	14 3 57.6	10.385
19	18 46 48.91	2.3702	20 21 57.2	5.397	19	20 38 20.60	2.2697	13 53 31.9	10.470
20	18 49 11.08	2.3687	20 16 29.7	5.520	20	20 40 36.71	2.2673	13 43 1.2	10.553
21	18 51 33.16	2.3673	20 10 54.8	5.643	21	20 42 52.68	2.2651	13 32 25.5	10.636
22	18 53 55.16	2.3659	20 5 12.6	5.764	22	20 45 8.52	2.2629	13 21 44.9	10.717
23	18 56 17.07	2.3643	S.19 59 23.1	5.886	23	20 47 24.23	2.2607	S.13 10 59.5	10.797
	FRIDAY 18.					**SUNDAY 20.**			
0	18 58 38.88	2.3627	S.19 53 26.3	6.007	0	20 49 39.80	2.2585	S.13 0 9.3	10.876
1	19 1 0.60	2.3611	19 47 22.3	6.127	1	20 51 55.25	2.2563	12 49 14.4	10.954
2	19 3 22.21	2.3593	19 41 11.1	6.246	2	20 54 10.56	2.2542	12 38 14.8	11.032
3	19 5 43.72	2.3577	19 34 52.8	6.365	3	20 56 25.75	2.2521	12 27 10.6	11.108
4	19 8 5.13	2.3559	19 28 27.3	6.483	4	20 58 40.81	2.2500	12 16 1.9	11.182
5	19 10 26.43	2.3541	19 21 54.8	6.600	5	21 0 55.75	2.2480	12 4 48.8	11.256
6	19 12 47.62	2.3522	19 15 15.3	6.718	6	21 3 10.57	2.2458	11 53 31.2	11.329
7	19 15 8.70	2.3503	19 8 28.7	6.834	7	21 5 25.26	2.2438	11 42 9.3	11.400
8	19 17 29.66	2.3484	19 1 35.2	6.950	8	21 7 39.83	2.2419	11 30 43.2	11.470
9	19 19 50.51	2.3465	18 54 34.7	7.065	9	21 9 54.29	2.2400	11 19 12.9	11.540
10	19 22 11.24	2.3445	18 47 27.4	7.178	10	21 12 8.63	2.2381	11 7 38.4	11.608
11	19 24 31.85	2.3425	18 40 13.3	7.292	11	21 14 22.86	2.2362	10 55 59.9	11.676
12	19 26 52.34	2.3404	18 32 52.4	7.405	12	21 16 36.97	2.2342	10 44 17.2	11.743
13	19 29 12.70	2.3383	18 25 24.7	7.517	13	21 18 50.97	2.2325	10 32 30.7	11.807
14	19 31 32.94	2.3362	18 17 50.4	7.628	14	21 21 4.87	2.2308	10 20 40.4	11.870
15	19 33 53.05	2.3341	18 10 9.4	7.738	15	21 23 18.67	2.2291	10 8 46.3	11.933
16	19 36 13.03	2.3319	18 2 21.8	7.848	16	21 25 32.36	2.2273	9 56 48.5	11.994
17	19 38 32.88	2.3297	17 54 27.7	7.957	17	21 27 45.95	2.2257	9 44 47.0	12.054
18	19 40 52.60	2.3276	17 46 27.0	8.065	18	21 29 59.44	2.2241	9 32 42.0	12.113
19	19 43 12.19	2.3253	17 38 19.9	8.172	19	21 32 12.84	2.2225	9 20 33.4	12.172
20	19 45 31.64	2.3231	17 30 6.4	8.278	20	21 34 26.14	2.2209	9 8 21.4	12.228
21	19 47 50.96	2.3208	17 21 46.5	8.384	21	21 36 39.35	2.2194	8 56 6.0	12.284
22	19 50 10.14	2.3186	17 13 20.3	8.488	22	21 38 52.47	2.2180	8 43 47.3	12.338
23	19 52 29.19	2.3162	17 4 47.9	8.592	23	21 41 5.51	2.2166	8 31 25.4	12.392
24	19 54 48.09	2.3139	S.16 56 9.3	8.695	24	21 43 18.46	2.2152	S. 8 19 0.2	12.445

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 21.					WEDNESDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 43 18.46	2.2152	S. 8 19 0.2	12.445	0	23 29 2.56	2.2118	N. 2 15 18.9	13.502
1	21 45 31.33	2.2139	8 6 32.0	12.495	1	23 31 15.31	2.2131	2 28 48.7	13.492
2	21 47 44.13	2.2127	7 54 0.8	12.545	2	23 33 28.13	2.2144	2 42 17.9	13.481
3	21 49 56.85	2.2114	7 41 26.6	12.594	3	23 35 41.04	2.2158	2 55 46.4	13.468
4	21 52 9.50	2.2102	7 28 49.5	12.642	4	23 37 54.03	2.2173	3 9 14.1	13.454
5	21 54 22.08	2.2091	7 16 9.6	12.688	5	23 40 7.12	2.2189	3 22 40.9	13.439
6	21 56 34.59	2.2080	7 3 27.0	12.733	6	23 42 20.30	2.2205	3 36 6.8	13.423
7	21 58 47.04	2.2070	6 50 41.7	12.777	7	23 44 33.58	2.2222	3 49 31.7	13.406
8	22 0 59.43	2.2060	6 37 53.8	12.819	8	23 46 46.96	2.2238	4 2 55.5	13.387
9	22 3 11.76	2.2051	6 25 3.4	12.861	9	23 49 0.44	2.2256	4 16 18.1	13.366
10	22 5 24.04	2.2042	6 12 10.5	12.901	10	23 51 14.03	2.2274	4 29 39.4	13.343
11	22 7 36.26	2.2032	5 59 15.3	12.939	11	23 53 27.73	2.2293	4 42 59.3	13.320
12	22 9 48.43	2.2025	5 46 17.8	12.977	12	23 55 41.55	2.2312	4 56 17.8	13.296
13	22 12 0.56	2.2018	5 33 18.0	13.014	13	23 57 55.48	2.2331	5 9 34.8	13.270
14	22 14 12.65	2.2012	5 20 16.1	13.049	14	0 0 9.52	2.2351	5 22 50.2	13.243
15	22 16 24.70	2.2005	5 7 12.1	13.083	15	0 2 23.69	2.2372	5 36 3.9	13.213
16	22 18 36.71	2.1999	4 54 6.1	13.117	16	0 4 37.99	2.2393	5 49 15.8	13.183
17	22 20 48.69	2.1995	4 40 58.1	13.148	17	0 6 52.41	2.2415	6 2 25.9	13.152
18	22 23 0.65	2.1991	4 27 48.3	13.178	18	0 9 6.97	2.2437	6 15 34.1	13.119
19	22 25 12.58	2.1987	4 14 36.7	13.208	19	0 11 21.66	2.2460	6 28 40.2	13.084
20	22 27 24.49	2.1983	4 1 23.3	13.237	20	0 13 36.49	2.2482	6 41 44.2	13.048
21	22 29 36.38	2.1980	3 48 8.3	13.263	21	0 15 51.45	2.2506	6 54 46.0	13.012
22	22 31 48.25	2.1977	3 34 51.7	13.289	22	0 18 6.56	2.2530	7 7 45.6	12.973
23	22 34 0.11	2.1975	S. 3 21 33.6	13.313	23	0 20 21.81	2.2554	N. 7 20 42.8	12.933
	TUESDAY 22.					THURSDAY 24.			
0	22 36 11.95	2.1974	S. 3 8 14.1	13.336	0	0 22 37.21	2.2579	N. 7 33 37.5	12.891
1	22 38 23.80	2.1974	2 54 53.3	13.358	1	0 24 52.76	2.2604	7 46 29.7	12.848
2	22 40 35.64	2.1973	2 41 31.2	13.378	2	0 27 8.46	2.2630	7 59 19.3	12.805
3	22 42 47.48	2.1974	2 28 7.9	13.398	3	0 29 24.32	2.2656	8 12 6.3	12.759
4	22 44 59.33	2.1975	2 14 43.5	13.415	4	0 31 40.33	2.2682	8 24 50.4	12.712
5	22 47 11.18	2.1977	2 1 18.1	13.432	5	0 33 56.50	2.2709	8 37 31.7	12.663
6	22 49 23.05	2.1979	1 47 51.7	13.448	6	0 36 12.84	2.2737	8 50 10.0	12.613
7	22 51 34.93	2.1982	1 34 24.3	13.462	7	0 38 29.34	2.2764	9 2 45.3	12.562
8	22 53 46.83	2.1985	1 20 56.2	13.474	8	0 40 46.01	2.2792	9 15 17.4	12.509
9	22 55 58.75	2.1989	1 7 27.4	13.485	9	0 43 2.85	2.2821	9 27 46.4	12.456
10	22 58 10.70	2.1993	0 53 58.0	13.496	10	0 45 19.86	2.2849	9 40 12.1	12.400
11	23 0 22.67	2.1998	0 40 27.9	13.505	11	0 47 37.04	2.2878	9 52 34.4	12.343
12	23 2 34.68	2.2004	0 26 57.4	13.512	12	0 49 54.40	2.2908	10 4 53.3	12.285
13	23 4 46.72	2.2010	S. 0 13 26.5	13.518	13	0 52 11.93	2.2937	10 17 8.6	12.225
14	23 6 58.80	2.2017	N. 0 0 4.8	13.523	14	0 54 29.65	2.2967	10 29 20.3	12.164
15	23 9 10.93	2.2025	0 13 36.3	13.527	15	0 56 47.54	2.2997	10 41 28.3	12.101
16	23 11 23.10	2.2033	0 27 8.0	13.529	16	0 59 5.61	2.3027	10 53 32.4	12.037
17	23 13 35.32	2.2042	0 40 39.8	13.531	17	1 1 23.87	2.3058	11 5 32.7	11.972
18	23 15 47.60	2.2051	0 54 11.7	13.531	18	1 3 42.31	2.3089	11 17 29.0	11.905
19	23 17 59.93	2.2060	1 7 43.5	13.529	19	1 6 0.94	2.3121	11 29 21.3	11.837
20	23 20 12.32	2.2071	1 21 15.2	13.526	20	1 8 19.76	2.3152	11 41 9.4	11.767
21	23 22 24.78	2.2082	1 34 46.6	13.521	21	1 10 38.76	2.3183	11 52 53.4	11.696
22	23 24 37.30	2.2093	1 48 17.7	13.516	22	1 12 57.95	2.3215	12 4 33.0	11.623
23	23 26 49.89	2.2105	2 1 48.5	13.510	23	1 15 17.34	2.3247	12 16 8.2	11.549
24	23 29 2.56	2.2118	N. 2 15 18.9	13.502	24	1 17 36.91	2.3278	N. 12 27 38.9	11.474

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 25.					SUNDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 17 36.91	2.3278	N.12 27 38.9	11.474	0	3 12 55.86	2.4659	N.19 47 14.2	6.398
1	1 19 56.68	2.3312	12 39 5.1	11.398	1	3 15 23.87	2.4677	19 53 34.1	6.266
2	1 22 16.65	2.3344	12 50 26.7	11.321	2	3 17 51.99	2.4695	19 59 46.1	6.134
3	1 24 36.81	2.3376	13 1 43.6	11.241	3	3 20 20.21	2.4712	20 5 50.2	6.002
4	1 26 57.16	2.3408	13 12 55.6	11.160	4	3 22 48.53	2.4727	20 11 46.3	5.868
5	1 29 17.71	2.3441	13 24 2.8	11.078	5	3 25 16.94	2.4742	20 17 34.4	5.735
6	1 31 38.45	2.3473	13 35 5.0	10.995	6	3 27 45.43	2.4756	20 23 14.5	5.601
7	1 33 59.39	2.3507	13 46 2.2	10.910	7	3 30 14.01	2.4769	20 28 46.5	5.466
8	1 36 20.53	2.3539	13 56 54.2	10.823	8	3 32 42.66	2.4782	20 34 10.4	5.330
9	1 38 41.86	2.3572	14 7 41.0	10.736	9	3 35 11.39	2.4793	20 39 26.1	5.194
10	1 41 3.39	2.3604	14 18 22.5	10.648	10	3 37 40.18	2.4804	20 44 33.7	5.058
11	1 43 25.11	2.3636	14 28 58.7	10.558	11	3 40 9.04	2.4814	20 49 33.0	4.920
12	1 45 47.02	2.3669	14 39 29.5	10.467	12	3 42 37.95	2.4823	20 54 24.1	4.783
13	1 48 9.14	2.3702	14 49 54.7	10.373	13	3 45 6.92	2.4832	20 59 6.9	4.644
14	1 50 31.45	2.3734	15 0 14.3	10.280	14	3 47 35.93	2.4838	21 3 41.4	4.506
15	1 52 53.95	2.3767	15 10 28.3	10.185	15	3 50 4.98	2.4844	21 8 7.6	4.367
16	1 55 16.65	2.3799	15 20 36.5	10.088	16	3 52 34.06	2.4850	21 12 25.4	4.228
17	1 57 39.54	2.3832	15 30 38.8	9.989	17	3 55 3.18	2.4855	21 16 34.9	4.088
18	2 0 2.63	2.3864	15 40 35.2	9.891	18	3 57 32.32	2.4858	21 20 35.9	3.948
19	2 2 25.91	2.3896	15 50 25.7	9.791	19	4 0 1.48	2.4861	21 24 28.6	3.808
20	2 4 49.38	2.3927	16 0 10.1	9.688	20	4 2 30.65	2.4862	21 28 12.8	3.667
21	2 7 13.03	2.3958	16 9 48.3	9.585	21	4 4 59.83	2.4863	21 31 48.7	3.526
22	2 9 36.88	2.3990	16 19 20.3	9.482	22	4 7 29.01	2.4863	21 35 16.0	3.385
23	2 12 0.91	2.4020	N.16 28 46.1	9.377	23	4 9 58.19	2.4862	N.21 38 34.9	3.243
	SATURDAY 26.					MONDAY 28.			
0	2 14 25.12	2.4051	N.16 38 5.5	9.270	0	4 12 27.35	2.4859	N.21 41 45.2	3.102
1	2 16 49.52	2.4082	16 47 18.5	9.163	1	4 14 56.50	2.4856	21 44 47.1	2.960
2	2 19 14.10	2.4112	16 56 25.0	9.053	2	4 17 25.62	2.4852	21 47 40.4	2.818
3	2 21 38.86	2.4142	17 5 24.9	8.943	3	4 19 54.72	2.4847	21 50 25.3	2.677
4	2 24 3.80	2.4172	17 14 18.2	8.833	4	4 22 23.79	2.4841	21 53 1.6	2.534
5	2 26 28.92	2.4201	17 23 4.8	8.720	5	4 24 52.81	2.4833	21 55 29.4	2.393
6	2 28 54.21	2.4229	17 31 44.6	8.607	6	4 27 21.79	2.4825	21 57 48.7	2.251
7	2 31 19.67	2.4257	17 40 17.6	8.493	7	4 29 50.71	2.4815	21 59 59.5	2.109
8	2 33 45.30	2.4285	17 48 43.7	8.378	8	4 32 19.57	2.4805	22 2 1.8	1.968
9	2 36 11.09	2.4312	17 57 2.9	8.261	9	4 34 48.37	2.4794	22 3 55.6	1.826
10	2 38 37.05	2.4340	18 5 15.0	8.143	10	4 37 17.10	2.4782	22 5 40.9	1.684
11	2 41 3.17	2.4366	18 13 20.0	8.024	11	4 39 45.75	2.4768	22 7 17.7	1.543
12	2 43 29.44	2.4392	18 21 17.9	7.905	12	4 42 14.32	2.4754	22 8 46.0	1.401
13	2 45 55.87	2.4417	18 29 8.7	7.784	13	4 44 42.80	2.4738	22 10 5.8	1.259
14	2 48 22.45	2.4442	18 36 52.1	7.662	14	4 47 11.19	2.4723	22 11 17.1	1.118
15	2 50 49.18	2.4467	18 44 28.1	7.539	15	4 49 39.48	2.4706	22 12 20.0	0.978
16	2 53 16.06	2.4492	18 51 56.8	7.416	16	4 52 7.66	2.4687	22 13 14.4	0.837
17	2 55 43.08	2.4515	18 59 18.0	7.292	17	4 54 35.73	2.4668	22 14 0.4	0.697
18	2 58 10.24	2.4537	19 6 31.8	7.167	18	4 57 3.68	2.4648	22 14 38.0	0.557
19	3 0 37.53	2.4559	19 13 38.0	7.040	19	4 59 31.50	2.4627	22 15 7.2	0.417
20	3 3 4.95	2.4581	19 20 36.6	6.913	20	5 1 59.20	2.4605	22 15 28.0	0.278
21	3 5 32.50	2.4602	19 27 27.6	6.786	21	5 4 26.76	2.4582	22 15 40.5	+ 0.138
22	3 8 0.17	2.4622	19 34 10.9	6.657	22	5 6 54.18	2.4558	22 15 44.6	− 0.001
23	3 10 27.96	2.4641	19 40 46.4	6.528	23	5 9 21.46	2.4533	22 15 40.4	0.138
24	3 12 55.86	2.4659	N.19 47 14.2	6.398	24	5 11 48.58	2.4507	N.22 15 28.0	0.276

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ' "	"
0	5 11 48.58	2.4507	N.22 15 28.0	0.276
1	5 14 15.54	2.4480	22 15 7.3	0.413
2	5 16 42.34	2.4452	22 14 38.4	0.550
3	5 19 8.97	2.4424	22 14 1.3	0.687
4	5 21 35.43	2.4395	22 13 16.0	0.823
5	5 24 1.71	2.4364	22 12 22.6	0.958
6	5 26 27.80	2.4332	22 11 21.1	1.093
7	5 28 53.70	2.4300	22 10 11.5	1.227
8	5 31 19.40	2.4267	22 8 53.9	1.360
9	5 33 44.91	2.4234	22 7 28.3	1.493
10	5 36 10.21	2.4199	22 5 54.8	1.625
11	5 38 35.30	2.4164	22 4 13.3	1.757
12	5 41 0.18	2.4128	22 2 24.0	1.888
13	5 43 24.84	2.4091	22 0 26.8	2.018
14	5 45 49.27	2.4052	21 58 21.9	2.147
15	5 48 13.47	2.4014	21 56 9.2	2.276
16	5 50 37.44	2.3976	21 53 48.8	2.404
17	5 53 1.18	2.3936	21 51 20.7	2.531
18	5 55 24.67	2.3895	21 48 45.1	2.657
19	5 57 47.92	2.3854	21 46 1.9	2.783
20	6 0 10.92	2.3812	21 43 11.1	2.908
21	6 2 33.66	2.3769	21 40 12.9	3.032
22	6 4 56.15	2.3727	21 37 7.3	3.155
23	6 7 18.38	2.3682	N.21 33 54.3	3.277

WEDNESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 9 40.33	2.3637	N.21 30 34.0	3.398
1	6 12 2.02	2.3592	21 27 6.5	3.519
2	6 14 23.44	2.3547	21 23 31.7	3.639
3	6 16 44.58	2.3501	21 19 49.8	3.758
4	6 19 5.45	2.3455	21 16 0.8	3.875
5	6 21 26.04	2.3408	21 12 4.8	3.992
6	6 23 46.34	2.3359	21 8 1.8	4.108
7	6 26 6.35	2.3312	21 3 51.8	4.224
8	6 28 26.08	2.3263	20 59 34.9	4.338
9	6 30 45.51	2.3213	20 55 11.3	4.450
10	6 33 4.64	2.3164	20 50 40.9	4.563
11	6 35 23.48	2.3115	20 46 3.8	4.674
12	6 37 42.02	2.3065	20 41 20.0	4.784
13	6 40 0.26	2.3014	20 36 29.7	4.893
14	6 42 18.19	2.2963	20 31 32.8	5.002
15	6 44 35.82	2.2912	20 26 29.5	5.108
16	6 46 53.14	2.2861	20 21 19.8	5.215
17	6 49 10.15	2.2809	20 16 3.7	5.320
18	6 51 26.85	2.2757	20 10 41.4	5.424
19	6 53 43.24	2.2705	20 5 12.8	5.528
20	6 55 59.31	2.2652	19 59 38.1	5.629
21	6 58 15.07	2.2600	19 53 57.3	5.730
22	7 0 30.51	2.2547	19 48 10.5	5.830
23	7 2 45.63	2.2493	19 42 17.7	5.929
24	7 5 0.43	2.2441	N.19 36 19.0	6.027

THURSDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ' "	"
0	7 5 0.43	2.2441	N.19 36 19.0	6.027
1	7 7 14.92	2.2387	19 30 14.5	6.123
2	7 9 29.08	2.2333	19 24 4.2	6.220
3	7 11 42.92	2.2280	19 17 48.1	6.315
4	7 13 56.44	2.2227	19 11 26.4	6.408
5	7 16 9.64	2.2172	19 4 59.1	6.502
6	7 18 22.51	2.2119	18 58 26.2	6.593
7	7 20 35.07	2.2066	18 51 47.9	6.683
8	7 22 47.30	2.2012	18 45 4.2	6.773
9	7 24 59.21	2.1957	18 38 15.2	6.861
10	7 27 10.79	2.1903	18 31 20.9	6.949
11	7 29 22.05	2.1850	18 24 21.3	7.037
12	7 31 32.99	2.1796	18 17 16.5	7.122
13	7 33 43.60	2.1742	18 10 6.7	7.205
14	7 35 53.90	2.1689	18 2 51.9	7.288
15	7 38 3.87	2.1635	17 55 32.1	7.371
16	7 40 13.52	2.1581	17 48 7.4	7.452
17	7 42 22.84	2.1527	17 40 37.9	7.532
18	7 44 31.85	2.1475	17 33 3.6	7.611
19	7 46 40.54	2.1422	17 25 24.6	7.689
20	7 48 48.91	2.1369	17 17 40.9	7.766
21	7 50 56.97	2.1317	17 9 52.7	7.842
22	7 53 4.71	2.1263	17 1 59.9	7.918
23	7 55 12.13	2.1212	N.16 54 2.6	7.998

FRIDAY, JUNE 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	7 57 19.25	2.1160	N.16 46 0.8	8.064

PHASES OF THE MOON.

			d	h	m
☽	First Quarter . . .	May	6	1	39.0
○	Full Moon		14	3	36.6
☾	Last Quarter		21	8	30.9
●	New Moon		28	2	49.8

			d	h
☾	Apogee	May	8	14.3
☾	Perigee		24	6.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	SUN	W.	30 4 47	2746	31 40 26	2761	33 15 45	2779	34 50 41	2796
	Pollux	E.	41 33 23	2571	39 53 48	2600	38 14 53	2630	36 36 39	2663
	Regulus	E.	77 43 39	2431	76 0 49	2448	74 18 23	2465	72 36 21	2482
2	SUN	W.	42 39 42	2883	44 12 22	2901	45 44 39	2920	47 16 32	2939
	Regulus	E.	64 12 21	2572	62 32 48	2591	60 53 40	2609	59 14 57	2627
	Spica	E.	118 7 30	2550	116 27 26	2567	114 47 46	2584	113 8 29	2601
3	SUN	W.	54 50 14	3029	56 19 51	3047	57 49 5	3064	59 17 59	3079
	Aldebaran	W.	29 5 31	2772	30 40 36	2782	32 15 28	2792	33 50 7	2801
	Regulus	E.	51 7 34	2719	49 31 19	2738	47 55 29	2756	46 20 3	2774
	Spica	E.	104 57 57	2687	103 20 59	2704	101 44 24	2720	100 8 11	2736
4	SUN	W.	66 37 20	3164	68 4 12	3179	69 30 46	3195	70 57 1	3210
	Aldebaran	W.	41 39 50	2859	43 13 1	2870	44 45 58	2883	46 18 39	2895
	VENUS	W.	22 14 51	3249	23 40 2	3254	25 5 7	3260	26 30 5	3266
	Regulus	E.	38 28 54	2866	36 55 52	2886	35 23 15	2905	33 51 2	2924
	Spica	E.	92 12 19	2814	90 38 9	2828	89 4 18	2842	87 30 45	2857
5	SUN	W.	78 3 58	3279	79 28 34	3292	80 52 55	3304	82 17 2	3316
	Aldebaran	W.	53 58 19	2951	55 29 33	2962	57 0 34	2972	58 31 22	2982
	VENUS	W.	33 32 47	3307	34 56 50	3316	36 20 43	3325	37 44 26	3334
	Spica	E.	79 47 24	2921	78 15 32	2933	76 43 55	2944	75 12 32	2955
6	SUN	W.	89 14 25	3367	90 37 19	3376	92 0 3	3385	93 22 37	3392
	Aldebaran	W.	66 2 23	3026	67 32 4	3034	69 1 35	3041	70 30 57	3047
	VENUS	W.	44 40 32	3374	46 3 18	3380	47 25 57	3387	48 48 28	3393
	Pollux	W.	25 30 40	3370	26 53 31	3341	28 16 55	3319	29 40 44	3300
	Spica	E.	67 38 53	3003	66 8 44	3012	64 38 46	3019	63 8 57	3026
	JUPITER	E.	113 50 21	2963	112 19 22	2971	110 48 33	2978	109 17 53	2985
7	SUN	W.	100 13 29	3423	101 35 19	3428	102 57 4	3432	104 18 44	3436
	Aldebaran	W.	77 55 53	3075	79 24 33	3079	80 53 8	3083	82 21 38	3087
	VENUS	W.	55 39 26	3418	57 1 22	3422	58 23 13	3425	59 45 1	3429
	Pollux	W.	36 44 24	3240	38 9 46	3232	39 35 17	3225	41 0 56	3220
	Spica	E.	55 41 56	3056	54 12 53	3061	52 43 56	3065	51 15 3	3069
	JUPITER	E.	101 46 35	3014	100 16 40	3018	98 46 50	3022	97 17 5	3025
8	SUN	W.	111 6 13	3447	112 27 36	3447	113 48 59	3448	115 10 21	3448
	VENUS	W.	66 33 22	3435	67 54 59	3435	69 16 36	3434	70 38 14	3434
	Pollux	W.	48 10 47	3195	49 37 2	3190	51 3 23	3186	52 29 49	3182
	Spica	E.	43 51 36	3080	42 23 2	3081	40 54 29	3081	39 25 56	3082
	JUPITER	E.	89 49 9	3035	88 19 40	3037	86 50 13	3036	85 20 45	3036
	SATURN	E.	115 56 15	3062	114 27 19	3063	112 58 24	3063	111 29 29	3062
9	SUN	W.	121 57 26	3440	123 18 57	3437	124 40 32	3434	126 2 10	3431
	VENUS	W.	77 26 44	3423	78 48 34	3419	80 10 29	3415	81 32 28	3411
	Pollux	W.	59 43 20	3158	61 10 19	3153	62 37 24	3148	64 4 36	3142
	Regulus	W.	22 43 16	3202	24 9 23	3183	25 35 52	3169	27 2 38	3157
	Spica	E.	32 3 10	3078	30 34 33	3075	29 5 53	3073	27 37 11	3071
	JUPITER	E.	77 53 10	3028	76 23 32	3026	74 53 52	3023	73 24 8	3019
	SATURN	E.	104 4 37	3055	102 35 32	3053	101 6 25	3050	99 37 14	3045

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Sun	W.	36 25 14	2812	37 59 26	2830	39 33 15	2848	41 6 40	2866
	Pollux	E.	34 59 9	2698	33 22 27	2737	31 46 36	2777	30 11 38	2823
	Regulus	E.	70 54 43	2500	69 13 30	2519	67 32 43	2536	65 52 20	2553
2	Sun	W.	48 48 2	2957	50 19 9	2974	51 49 54	2993	53 20 15	3011
	Regulus	E.	57 36 39	2646	55 58 46	2663	54 21 17	2682	52 44 13	2701
	Spica	E.	111 29 36	2619	109 51 7	2636	108 13 1	2653	106 35 18	2669
3	Sun	W.	60 46 34	3097	62 14 47	3116	63 42 37	3132	65 10 8	3148
	Aldebaran	W.	35 24 33	2812	36 58 45	2824	38 32 42	2836	40 6 24	2848
	Regulus	E.	44 45 1	2793	43 10 24	2811	41 36 10	2829	40 2 20	2848
	Spica	E.	98 32 19	2752	96 56 48	2768	95 21 38	2784	93 46 49	2798
4	Sun	W.	72 22 58	3225	73 48 38	3239	75 14 1	3253	76 39 4	3266
	Aldebaran	W.	47 51 4	2907	49 23 14	2918	50 55 10	2930	52 26 51	2940
	Venus	W.	27 54 56	3274	29 19 38	3282	30 44 11	3290	32 8 34	3299
	Regulus	E.	32 19 13	2944	30 47 50	2965	29 16 53	2985	27 46 22	3008
	Spica	E.	85 57 31	2870	84 24 34	2884	82 51 55	2897	81 19 32	2909
5	Sun	W.	83 40 55	3327	85 4 35	3338	86 28 3	3347	87 51 20	3358
	Aldebaran	W.	60 1 57	2992	61 32 20	3001	63 2 32	3009	64 32 33	3018
	Venus	W.	39 7 58	3343	40 31 20	3351	41 54 33	3358	43 17 37	3366
	Spica	E.	73 41 23	2965	72 10 27	2976	70 39 44	2985	69 9 13	2994
6	Sun	W.	94 45 3	3400	96 7 20	3406	97 29 30	3412	98 51 33	3418
	Aldebaran	W.	72 0 11	3054	73 29 17	3060	74 58 15	3065	76 27 7	3070
	Venus	W.	50 10 52	3400	51 33 9	3405	52 55 20	3410	54 17 26	3415
	Pollux	W.	31 4 55	3284	32 29 25	3270	33 54 12	3259	35 19 12	3248
	Spica	E.	61 39 17	3034	60 9 46	3039	58 40 22	3046	57 11 6	3051
	Jupiter	E.	107 47 22	2993	106 17 0	2998	104 46 45	3004	103 16 37	3009
7	Sun	W.	105 40 20	3438	107 1 53	3442	108 23 22	3445	109 44 48	3446
	Aldebaran	W.	83 50 4	3090	85 18 26	3092	86 46 46	3094	88 15 3	3095
	Venus	W.	61 6 45	3431	62 28 26	3432	63 50 6	3433	65 11 45	3435
	Pollux	W.	42 26 42	3214	43 52 34	3209	45 18 33	3204	46 44 37	3199
	Spica	E.	49 46 15	3072	48 17 31	3074	46 48 50	3076	45 20 12	3078
	Jupiter	E.	95 47 23	3028	94 17 45	3031	92 48 11	3033	91 18 39	3034
8	Sun	W.	116 31 43	3447	117 53 6	3446	119 14 31	3445	120 35 57	3443
	Venus	W.	71 59 52	3432	73 21 32	3431	74 43 13	3429	76 4 57	3426
	Pollux	W.	53 56 20	3177	55 22 57	3173	56 49 39	3168	58 16 27	3163
	Spica	E.	37 57 24	3082	36 28 52	3081	35 0 19	3080	33 31 45	3079
	Jupiter	E.	83 51 17	3035	82 21 48	3034	80 52 18	3032	79 22 45	3030
	Saturn	E.	110 0 33	3062	108 31 37	3060	107 2 39	3059	105 33 39	3057
9	Sun	W.	127 23 52	3426	128 45 39	3422	130 7 31	3417	131 29 28	3411
	Venus	W.	82 54 32	3407	84 16 41	3402	85 38 55	3397	87 1 15	3391
	Pollux	W.	65 31 55	3136	66 59 21	3130	68 26 54	3124	69 54 34	3118
	Regulus	W.	28 29 39	3143	29 56 56	3131	31 24 28	3120	32 52 13	3110
	Spica	E.	26 8 26	3068	24 39 37	3066	23 10 46	3063	21 41 52	3060
	Jupiter	E.	71 54 19	3016	70 24 26	3012	68 54 28	3007	67 24 24	3001
	Saturn	E.	98 7 57	3042	96 38 36	3038	95 9 10	3033	93 39 38	3028

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	Venus	W.	88 23 42	3385	89 46 16	3379	91 8 56	3372	92 31 44	3365
	Pollux	W.	71 22 22	3112	72 50 17	3105	74 18 21	3098	75 46 33	3091
	Regulus	W.	34 20 10	3100	35 48 20	3090	37 16 42	3080	38 45 16	3071
	Jupiter	E.	65 54 13	2997	64 23 56	2992	62 53 33	2986	61 23 2	2980
	Saturn	E.	92 10 0	3023	90 40 16	3018	89 10 25	3012	87 40 27	3005
	α Aquilæ	E.	116 41 21	3593	115 22 39	3575	114 3 37	3556	112 44 15	3538
11	Venus	W.	99 27 52	3326	100 51 33	3319	102 15 23	3310	103 39 23	3300
	Pollux	W.	83 9 46	3053	84 38 53	3046	86 8 9	3038	87 37 35	3029
	Regulus	W.	46 10 58	3024	47 40 41	3014	49 10 36	3005	50 40 43	2995
	Jupiter	E.	53 48 28	2946	52 17 7	2938	50 45 36	2931	49 13 56	2922
	Saturn	E.	80 8 34	2971	78 37 45	2963	77 6 46	2955	75 35 37	2947
	α Aquilæ	E.	106 2 44	3460	104 41 35	3446	103 20 10	3431	101 58 29	3418
12	Venus	W.	110 42 3	3254	112 7 8	3245	113 32 24	3235	114 57 52	3225
	Pollux	W.	95 7 22	2987	96 37 51	2978	98 8 31	2969	99 39 22	2961
	Regulus	W.	58 14 17	2946	59 45 37	2937	61 17 9	2927	62 48 54	2916
	Jupiter	E.	41 32 57	2880	40 0 12	2871	38 27 16	2862	36 54 8	2853
	Saturn	E.	67 57 16	2905	66 25 3	2895	64 52 38	2886	63 20 1	2876
	α Aquilæ	E.	95 6 28	3358	93 43 24	3348	92 20 9	3338	90 56 41	3328
	Fomalhaut	E.	121 30 3	3591	120 11 19	3562	118 52 3	3534	117 32 16	3506
13	Regulus	W.	70 30 51	2866	72 3 53	2856	73 37 8	2846	75 10 36	2835
	Jupiter	E.	29 5 33	2807	27 31 14	2798	25 56 43	2788	24 22 0	2779
	Saturn	E.	55 33 55	2829	54 0 5	2819	52 26 2	2809	50 51 46	2799
	α Aquilæ	E.	83 56 44	3287	82 32 17	3280	81 7 42	3275	79 43 1	3269
	Fomalhaut	E.	110 46 18	3390	109 23 50	3371	108 1 0	3351	106 37 47	3332
14	Regulus	W.	83 1 16	2785	84 36 3	2775	86 11 3	2765	87 46 17	2756
	Spica	W.	28 58 38	2774	30 33 40	2763	32 8 56	2753	33 44 26	2742
	Saturn	E.	42 57 14	2750	41 21 41	2741	39 45 56	2731	38 9 57	2721
	α Aquilæ	E.	72 38 15	3253	71 13 9	3253	69 48 2	3253	68 22 55	3254
	Fomalhaut	E.	99 36 43	3253	98 11 36	3239	96 46 13	3225	95 20 34	3214
15	Regulus	W.	95 45 37	2707	97 22 7	2698	98 58 49	2689	100 35 44	2679
	Spica	W.	41 45 22	2692	43 22 13	2681	44 59 18	2672	46 36 36	2663
	Saturn	E.	30 6 50	2674	28 29 35	2664	26 52 7	2655	25 14 27	2646
	α Aquilæ	E.	61 18 18	3282	59 53 46	3293	58 29 26	3305	57 5 20	3319
	Fomalhaut	E.	88 8 58	3163	86 42 5	3156	85 15 3	3149	83 47 53	3142
	α Pegasi	E.	107 3 37	2834	105 29 53	2823	103 55 55	2811	102 21 41	2799
16	Spica	W.	54 46 15	2616	56 24 48	2607	58 3 34	2598	59 42 33	2589
	α Aquilæ	E.	50 9 59	3434	48 48 21	3467	47 27 20	3506	46 7 3	3549
	Fomalhaut	E.	76 30 14	3121	75 2 30	3122	73 34 47	3122	72 7 4	3123
	α Pegasi	E.	94 26 59	2748	92 51 23	2739	91 15 36	2730	89 39 36	2721
17	Spica	W.	68 0 22	2546	69 40 31	2538	71 20 51	2530	73 1 23	2522
	Jupiter	W.	23 5 0	2510	24 45 59	2501	26 27 11	2492	28 8 35	2485
	α Aquilæ	E.	39 39 48	3876	38 26 4	3971	37 13 56	4081	36 3 36	4205
	Fomalhaut	E.	64 49 19	3148	63 22 8	3158	61 55 9	3170	60 28 24	3183
	α Pegasi	E.	81 36 51	2683	79 59 48	2676	78 22 36	2669	76 45 15	2663
	Mars	E.	119 43 30	2811	118 9 16	2801	116 34 49	2792	115 0 10	2782

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	VENUS	W.	93 54 41	3358	95 17 45	3351	96 40 58	3343	98 4 20	3334
	Pollux	W.	77 14 53	3084	78 43 22	3076	80 12 1	3069	81 40 49	3061
	Regulus	W.	40 14 1	3061	41 42 58	3052	43 12 6	3043	44 41 26	3033
	JUPITER	E.	59 52 24	2973	58 21 38	2966	56 50 43	2960	55 19 40	2953
	SATURN	E.	86 10 21	2999	84 40 7	2993	83 9 45	2985	81 39 14	2978
	a Aquilæ	E.	111 24 33	3522	110 4 33	3505	108 44 14	3489	107 23 37	3474
11	VENUS	W.	105 3 34	3292	106 27 55	3283	107 52 26	3273	109 17 9	3264
	Pollux	W.	89 7 12	3021	90 36 59	3013	92 6 56	3004	93 37 4	2996
	Regulus	W.	52 11 2	2986	53 41 32	2976	55 12 15	2966	56 43 10	2956
	JUPITER	E.	47 42 5	2914	46 10 4	2906	44 37 53	2898	43 5 31	2888
	SATURN	E.	74 4 18	2939	72 32 49	2931	71 1 9	2922	69 29 18	2913
	a Aquilæ	E.	100 36 33	3405	99 14 22	3393	97 51 58	3381	96 29 20	3369
12	VENUS	W.	116 23 31	3215	117 49 22	3206	119 15 24	3196	120 41 38	3186
	Pollux	W.	101 10 24	2952	102 41 37	2944	104 13 0	2935	105 44 34	2927
	Regulus	W.	64 20 52	2907	65 53 2	2897	67 25 25	2886	68 58 2	2876
	JUPITER	E.	35 20 49	2844	33 47 18	2835	32 13 35	2825	30 39 40	2816
	SATURN	E.	61 47 12	2868	60 14 12	2858	58 40 59	2848	57 7 33	2838
	a Aquilæ	E.	89 33 2	3319	88 9 12	3310	86 45 12	3302	85 21 3	3294
	Fomalhaut	E.	116 11 59	3480	114 51 13	3457	113 30 1	3434	112 8 22	3412
13	Regulus	W.	76 44 18	2825	78 18 13	2816	79 52 20	2805	81 26 41	2795
	JUPITER	E.	22 47 5	2771	21 11 59	2762	19 36 42	2753	18 1 12	2744
	SATURN	E.	49 17 17	2790	47 42 36	2780	46 7 42	2769	44 32 34	2760
	a Aquilæ	E.	78 18 13	3265	76 53 20	3261	75 28 22	3257	74 3 20	3254
	Fomalhaut	E.	105 14 13	3315	103 50 19	3299	102 26 6	3282	101 1 33	3267
14	Regulus	W.	89 21 43	2746	90 57 22	2736	92 33 14	2726	94 9 19	2716
	Spica	W.	35 20 10	2732	36 56 8	2722	38 32 19	2711	40 8 44	2701
	SATURN	E.	36 33 45	2711	34 57 20	2702	33 20 43	2692	31 43 53	2683
	a Aquilæ	E.	66 57 50	3258	65 32 49	3261	64 7 52	3266	62 43 1	3273
	Fomalhaut	E.	93 54 41	3202	92 28 34	3191	91 2 14	3180	89 35 41	3172
15	Regulus	W.	102 12 52	2670	103 50 12	2662	105 27 43	2653	107 5 27	2644
	Spica	W.	48 14 6	2653	49 51 49	2643	51 29 45	2634	53 7 54	2625
	SATURN	E.	23 36 35	2638	21 58 32	2630	20 20 18	2621	18 41 51	2612
	a Aquilæ	E.	55 41 30	3336	54 18 0	3356	52 54 53	3378	51 32 11	3404
	Fomalhaut	E.	82 20 34	3134	80 53 6	3130	79 25 33	3126	77 57 55	3124
	a Pegasi	E.	100 47 12	2788	99 12 29	2779	97 37 33	2768	96 2 23	2757
16	Spica	W.	61 21 43	2580	63 1 5	2572	64 40 39	2563	66 20 24	2554
	a Aquilæ	E.	44 47 33	3599	43 28 58	3656	42 11 24	3720	40 54 58	3792
	Fomalhaut	E.	70 39 22	3125	69 11 43	3129	67 44 9	3134	66 16 40	3140
	a Pegasi	E.	88 3 24	2713	86 27 1	2705	84 50 28	2698	83 13 45	2689
17	Spica	W.	74 42 6	2514	76 23 0	2506	78 4 5	2498	79 45 21	2490
	JUPITER	W.	29 50 10	2476	31 31 57	2467	33 13 56	2460	34 56 6	2451
	a Aquilæ	E.	34 55 15	4351	33 49 9	4517	32 45 32	4709	31 44 40	4935
	Fomalhaut	E.	59 1 55	3200	57 35 46	3219	56 9 59	3239	54 44 36	3264
	a Pegasi	E.	75 7 46	2657	73 30 9	2653	71 52 26	2648	70 14 36	2643
	MARS	E.	113 25 19	2773	111 50 16	2765	110 15 3	2756	108 39 38	2747

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
18	Spica	W.	81 26 48	2483	83 8 25	2475	84 50 13	2468	86 32 11	2460
	Jupiter	W.	36 38 28	2444	38 21 0	2436	40 3 43	2429	41 46 37	2421
	α Pegasi	E.	68 36 39	2639	66 58 37	2636	65 20 31	2633	63 42 21	2630
	Mars	E.	107 4 1	2739	105 28 13	2732	103 52 15	2723	102 16 6	2715
	Sun	E.	133 12 33	2801	131 38 7	2793	130 3 30	2785	128 28 42	2777
19	Spica	W.	95 4 38	2424	96 47 38	2418	98 30 47	2410	100 14 7	2404
	Jupiter	W.	50 23 45	2385	52 7 41	2378	53 51 47	2371	55 36 3	2364
	Saturn	W.	23 28 52	2410	25 12 12	2403	26 55 43	2395	28 39 25	2388
	α Pegasi	E.	55 30 57	2629	53 52 41	2632	52 14 29	2635	50 36 21	2639
	Mars	E.	94 12 41	2676	92 35 29	2669	90 58 7	2661	89 20 35	2653
	Sun	E.	120 32 7	2738	118 56 17	2730	117 20 17	2722	115 44 7	2716
20	Jupiter	W.	64 19 53	2331	66 5 8	2324	67 50 32	2318	69 36 5	2311
	Saturn	W.	37 20 25	2354	39 5 6	2347	40 49 57	2341	42 34 57	2334
	Mars	E.	81 10 26	2618	79 31 56	2612	77 53 17	2604	76 14 28	2598
	Sun	E.	107 40 51	2679	106 3 43	2672	104 26 25	2665	102 48 59	2658
21	Jupiter	W.	78 26 8	2281	80 12 35	2276	81 59 10	2270	83 45 54	2264
	Saturn	W.	51 22 18	2303	53 8 13	2298	54 54 16	2292	56 40 28	2286
	Mars	E.	67 58 12	2566	66 18 31	2560	64 38 42	2554	62 58 44	2549
	Sun	E.	94 39 30	2626	93 1 10	2619	91 22 41	2613	89 44 4	2607
22	Jupiter	W.	92 41 32	2238	94 29 3	2234	96 16 40	2229	98 4 25	2225
	Saturn	W.	65 33 28	2260	67 20 27	2255	69 7 33	2250	70 54 47	2245
	α Aquilæ	W.	44 1 47	3270	45 26 34	3205	46 52 37	3148	48 19 49	3095
	Mars	E.	54 37 4	2523	52 56 23	2519	51 15 36	2515	49 34 43	2510
	Sun	E.	81 28 56	2579	79 49 32	2574	78 10 1	2569	76 30 23	2564
23	Saturn	W.	79 52 30	2225	81 40 20	2222	83 28 14	2219	85 16 14	2216
	α Aquilæ	W.	55 50 0	2898	57 22 21	2870	58 55 18	2843	60 28 50	2818
	Mars	E.	41 8 58	2494	39 27 36	2492	37 46 12	2490	36 4 45	2489
	Sun	E.	68 10 36	2543	66 30 22	2539	64 50 3	2535	63 9 39	2532
24	Saturn	W.	94 17 8	2205	96 5 27	2204	97 53 48	2203	99 42 10	2202
	α Aquilæ	W.	68 23 27	2729	69 59 28	2716	71 35 46	2705	73 12 19	2695
	Sun	E.	54 46 41	2521	53 5 57	2520	51 25 12	2519	49 44 25	2519
25	α Aquilæ	W.	81 17 40	2668	82 55 3	2666	84 32 29	2665	86 9 56	2666
	Fomalhaut	W.	55 8 21	2958	56 39 27	2928	58 11 10	2904	59 43 24	2881
	Sun	E.	41 20 30	2521	39 39 46	2523	37 59 5	2525	36 18 27	2527
26	α Aquilæ	W.	94 16 27	2687	95 53 25	2694	97 30 14	2703	99 6 50	2713
	Sun	E.	27 56 21	2547	26 16 13	2553	24 36 13	2558	22 56 20	2564
30	Sun	W.	23 44 4	2908	25 16 13	2924	26 48 2	2939	28 19 31	2954
	Regulus	E.	56 14 20	2614	54 35 44	2629	52 57 28	2645	51 19 34	2662
	Spica	E.	110 6 39	2585	108 27 23	2600	106 48 28	2615	105 9 53	2629
31	Sun	W.	35 52 0	3034	37 21 31	3050	38 50 42	3066	40 19 33	3081
	Regulus	E.	43 15 40	2746	41 40 1	2764	40 4 46	2782	38 29 54	2799
	Spica	E.	97 1 52	2702	95 25 15	2717	93 48 58	2732	92 13 0	2745

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
18	Spica	W.	88 14 20	2453	89 56 39	2446	91 39 8	2438	93 21 48	2431
	JUPITER	W.	43 29 42	2414	45 12 57	2406	46 56 23	2399	48 39 59	2392
	α Pegasi	E.	62 4 7	2629	60 25 51	2628	58 47 33	2627	57 9 15	2627
	MARS	E.	100 39 46	2707	99 3 16	2699	97 26 35	2691	95 49 43	2684
	SUN	E.	126 53 44	2769	125 18 35	2761	123 43 16	2753	122 7 47	2745
19	Spica	W.	101 57 36	2397	103 41 15	2391	105 25 3	2384	107 9 1	2377
	JUPITER	W.	57 20 30	2357	59 5 6	2350	60 49 52	2344	62 34 48	2337
	SATURN	W.	30 23 17	2381	32 7 19	2374	33 51 31	2367	35 35 53	2360
	α Pegasi	E.	48 58 18	2645	47 20 24	2654	45 42 42	2662	44 5 11	2673
	MARS	E.	87 42 52	2646	86 5 0	2639	84 26 58	2632	82 48 47	2625
	SUN	E.	114 7 48	2707	112 31 18	2701	110 54 39	2693	109 17 50	2686
20	JUPITER	W.	71 21 48	2305	73 7 40	2300	74 53 40	2293	76 39 50	2287
	SATURN	W.	44 20 7	2328	46 5 26	2322	47 50 54	2315	49 36 32	2309
	MARS	E.	74 35 30	2592	72 56 24	2585	71 17 9	2579	69 37 45	2572
	SUN	E.	101 11 23	2652	99 33 38	2645	97 55 44	2638	96 17 41	2632
21	JUPITER	W.	85 32 46	2259	87 19 46	2254	89 6 53	2248	90 54 9	2243
	SATURN	W.	58 26 48	2281	60 13 16	2275	61 59 52	2270	63 46 36	2264
	MARS	E.	61 18 39	2543	59 38 26	2538	57 58 6	2533	56 17 38	2528
	SUN	E.	88 5 18	2601	86 26 24	2596	84 47 23	2590	83 8 13	2584
22	JUPITER	W.	99 52 16	2220	101 40 13	2216	103 28 17	2212	105 16 27	2208
	SATURN	W.	72 42 7	2241	74 29 33	2237	76 17 6	2233	78 4 45	2229
	α Aquilæ	W.	49 48 5	3048	51 17 18	3005	52 47 25	2966	54 18 20	2931
	MARS	E.	47 53 44	2506	46 12 39	2503	44 31 30	2500	42 50 16	2497
	SUN	E.	74 50 38	2559	73 10 47	2554	71 30 49	2550	69 50 45	2546
23	SATURN	W.	87 4 18	2214	88 52 25	2211	90 40 36	2209	92 28 51	2207
	α Aquilæ	W.	62 2 54	2798	63 37 25	2779	65 12 21	2759	66 47 43	2742
	MARS	E.	34 23 17	2489	32 41 48	2489	31 0 20	2490	29 18 52	2492
	SUN	E.	61 29 10	2529	59 48 37	2527	58 8 2	2525	56 27 23	2522
24	SATURN	W.	101 30 34	2202	103 18 58	2203	105 7 21	2204	106 55 43	2204
	α Aquilæ	W.	74 49 5	2687	76 26 2	2681	78 3 7	2675	79 40 21	2671
	SUN	E.	48 3 38	2518	46 22 50	2519	44 42 3	2519	43 1 16	2520
25	α Aquilæ	W.	87 47 22	2668	89 24 45	2671	91 2 5	2674	92 39 19	2679
	Fomalhaut	W.	61 16 7	2862	62 49 14	2846	64 22 42	2831	65 56 29	2818
	SUN	E.	34 37 52	2531	32 57 22	2534	31 16 56	2538	29 36 36	2542
26	α Aquilæ	W.	100 43 13	2725	102 19 20	2738	103 55 10	2751	105 30 42	2766
	SUN	E.	21 16 36	2571	19 37 1	2578	17 57 36	2586	16 18 22	2593
30	SUN	W.	29 50 41	2971	31 21 30	2986	32 52 0	3002	34 22 10	3018
	Regulus	E.	49 42 3	2678	48 4 54	2695	46 28 7	2711	44 51 42	2729
	Spica	E.	103 31 37	2643	101 53 41	2658	100 16 5	2673	98 38 49	2687
31	SUN	W.	41 48 6	3096	43 16 20	3112	44 44 15	3127	46 11 52	3142
	Regulus	E.	36 55 25	2818	35 21 21	2838	33 47 42	2857	32 14 28	2877
	Spica	E.	90 37 20	2760	89 2 0	2774	87 26 58	2788	85 52 15	2802

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Frid.	1	4 35 35.70	10.229	N.22 2 1.6	+20.58	15 47.22	68.31	2 27.12	0.373
Sat.	2	4 39 41.42	10.245	22 10 4.2	19.62	15 47.09	68.37	2 17.97	0.389
SUN.	3	4 43 47.51	10.261	22 17 43.6	18.65	15 46.96	68.43	2 8.45	0.404
Mon.	4	4 47 53.97	10.275	22 24 59.7	+17.68	15 46.83	68.48	2 58.59	0.418
Tues.	5	4 52 0.75	10.289	22 31 52.3	16.70	15 46.71	68.53	1 48.39	0.431
Wed.	6	4 56 7.86	10.301	22 38 21.2	15.71	15 46.59	68.58	1 37.87	0.444
Thur.	7	5 0 15.26	10.313	22 44 26.4	+14.72	15 46.48	68.62	1 27.06	0.456
Frid.	8	5 4 22.93	10.324	22 50 7.5	13.72	15 46.37	68.66	1 15.97	0.467
Sat.	9	5 8 30.87	10.334	22 55 24.7	12.71	15 46.26	68.69	1 4.62	0.478
SUN.	10	5 12 39.05	10.344	23 0 17.6	+11.70	15 46.15	68.72	0 53.03	0.488
Mon.	11	5 16 47.45	10.353	23 4 46.5	10.69	15 46.05	68.75	0 41.21	0.497
Tues.	12	5 20 56.07	10.361	23 8 50.9	9.68	15 45.96	68.78	0 29.18	0.505
Wed.	13	5 25 4.87	10.368	23 12 30.9	+ 8.66	15 45.87	68.80	0 16.98	0.512
Thur.	14	5 29 13.83	10.375	23 15 46.3	7.63	15 45.78	68.82	0 4.61	0.519
Frid.	15	5 33 22.95	10.381	23 18 37.2	6.61	15 45.70	68.84	0 7.92	0.525
Sat.	16	5 37 32.22	10.386	23 21 3.4	+ 5.58	15 45.62	68.86	0 20.59	0.530
SUN.	17	5 41 41.59	10.390	23 23 4.9	4.55	15 45.55	68.87	0 33.37	0.534
Mon.	18	5 45 51.06	10.394	23 24 41.6	3.51	15 45.48	68.88	0 46.24	0.537
Tues.	19	5 50 0.61	10.397	23 25 53.5	+ 2.48	15 45.42	68.88	0 59.19	0.540
Wed.	20	5 54 10.20	10.398	23 26 40.7	1.45	15 45.36	68.88	1 12.19	0.542
Thur.	21	5 58 19.81	10.399	23 27 3.0	+ 0.41	15 45.30	68.87	1 25.22	0.543
Frid.	22	6 2 29.44	10.399	23 27 0.5	− 0.62	15 45.25	68.87	1 38.25	0.542
Sat.	23	6 6 39.03	10.398	23 26 33.1	1.66	15 45.20	68.87	1 51.26	0.541
SUN.	24	6 10 48.58	10.395	23 25 40.8	2.69	15 45.16	68.87	2 4.21	0.538
Mon.	25	6 14 58.05	10.391	23 24 23.9	− 3.72	15 45.12	68.86	2 17.09	0.535
Tues.	26	6 19 7.42	10.386	23 22 42.1	4.75	15 45.09	68.85	2 29.87	0.530
Wed.	27	6 23 16.64	10.380	23 20 35.8	5.78	15 45.06	68.83	2 42.50	0.523
Thur.	28	6 27 25.72	10.373	23 18 4.8	− 6.80	15 45.03	68.81	2 54.99	0.515
Frid.	29	6 31 34.61	10.365	23 15 9.3	7.82	15 45.01	68.78	3 7.28	0.507
Sat.	30	6 35 43.28	10.355	23 11 49.2	8.84	15 44.99	68.75	3 19.35	0.498
SUN.	31	6 39 51.70	10.344	N.23 8 4.9	− 9.85	15 44.98	68.71	3 31.18	0.488

Note.—The mean time of semidiameter passing may be found by subtracting $0^{s}.19$ from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign — indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Frid.	1	4 35 36.12	10.229	N.22 2 2.5	+20.58	2 27.10	0.373	4 38 3.21
Sat.	2	4 39 41.82	10.245	22 10 5.0	19.62	2 17.95	0.389	4 41 59.77
SUN.	3	4 43 47.88	10.261	22 17 44.3	18.65	2 8.44	0.404	4 45 56.33
Mon.	4	4 47 54.31	10.275	22 25 0.3	+17.68	1 58.58	0.418	4 49 52.88
Tues.	5	4 52 1.06	10.289	22 31 52.8	16.70	1 48.38	0.431	4 53 49.44
Wed.	6	4 56 8.14	10.301	22 38 21.6	15.71	1 37.86	0.444	4 57 46.00
Thur.	7	5 0 15.51	10.313	22 44 26.7	+14.72	1 27.05	0.456	5 1 42.56
Frid.	8	5 4 23.15	10.324	22 50 7.8	13.72	1 15.96	0.467	5 5 39.11
Sat.	9	5 8 31.06	10.334	22 55 24.9	12.71	1 4.61	0.478	5 9 35.67
SUN.	10	5 12 39.21	10.344	23 0 17.8	+11.70	0 53.02	0.488	5 13 32.23
Mon.	11	5 16 47.58	10.353	23 4 46.6	10.69	0 41.20	0.497	5 17 28.78
Tues.	12	5 20 56.16	10.361	23 8 51.0	9.68	0 29.18	0.505	5 21 25.34
Wed.	13	5 25 4.92	10.368	23 12 30.9	+ 8.66	0 16.98	0.512	5 25 21.90
Thur.	14	5 29 13.85	10.375	23 15 46.3	7.63	0 4.61	0.519	5 29 18.46
Frid.	15	5 33 22.93	10.381	23 18 37.2	6.61	0 7.92	0.525	5 33 15.01
Sat.	16	5 37 32.16	10.386	23 21 3.4	+ 5.58	0 20.59	0.530	5 37 11.57
SUN.	17	5 41 41.49	10.390	23 23 4.9	4.55	0 33.36	0.534	5 41 8.13
Mon.	18	5 45 50.92	10.394	23 24 41.6	3.51	0 46.23	0.537	5 45 4.69
Tues.	19	5 50 0.43	10.397	23 25 53.5	+ 2.48	0 59.18	0.540	5 49 1.24
Wed.	20	5 54 9.98	10.398	23 26 40.7	1.45	1 12.18	0.542	5 52 57.80
Thur.	21	5 58 19.56	10.399	23 27 3.0	+ 0.41	1 25.21	0.543	5 56 54.36
Frid.	22	6 2 29.15	10.399	23 27 0.5	− 0.62	1 38.24	0.542	6 0 50.92
Sat.	23	6 6 38.71	10.398	23 26 33.1	1.66	1 51.24	0.541	6 4 47.47
SUN.	24	6 10 48.22	10.395	23 25 40.9	2.69	2 4.19	0.538	6 8 44.03
Mon.	25	6 14 57.66	10.391	23 24 24.0	− 3.72	2 17.07	0.535	6 12 40.59
Tues.	26	6 19 6.99	10.386	23 22 42.3	4.75	2 29.85	0.530	6 16 37.14
Wed.	27	6 23 16.18	10.380	23 20 36.0	5.78	2 42.48	0.523	6 20 33.70
Thur.	28	6 27 25.22	10.373	23 18 5.1	− 6.80	2 54.96	0.515	6 24 30.26
Frid.	29	6 31 34.07	10.365	23 15 9.7	7.82	3 7.25	0.507	6 28 26.82
Sat.	30	6 35 42.70	10.355	23 11 49.7	8.84	3 19.32	0.498	6 32 23.37
SUN.	31	6 39 51.09	10.344	N.23 8 5.5	− 9.85	3 31.15	0.488	6 36 19.93

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign — indicates that north declinations are decreasing.

Diff. for 1 Hour, +9^s.8565. (Table III.)

AT GREENWICH MEAN NOON.								
		THE SUN'S						
Day of the Month.	Day of the Year.	TRUE LONGITUDE. λ	TRUE LONGITUDE. λ′	Diff. for 1 Hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	152	70 30 44.5	30 7.9	143.72	− 0.24	0.0061947	+25.4	19 18 46.43
2	153	71 28 13.1	27 36.3	143.67	0.32	0.0062549	24.6	19 14 50.52
3	154	72 25 40.5	25 3.6	143.62	0.38	0.0063130	23.8	19 10 54.61
4	155	73 23 6.7	22 29.6	143.57	− 0.41	0.0063691	+23.0	19 6 58.70
5	156	74 20 31.7	19 54.4	143.52	0.40	0.0064233	22.2	19 3 2.79
6	157	75 17 55.5	17 18.1	143.47	0.39	0.0064757	21.5	18 59 6.88
7	158	76 15 18.3	14 40.7	143.42	− 0.33	0.0065263	+20.8	18 55 10.96
8	159	77 12 40.0	12 2.2	143.38	0.26	0.0065753	20.1	18 51 15.05
9	160	78 10 0.7	9 22.8	143.34	0.17	0.0066227	19.5	18 47 19.14
10	161	79 7 20.4	6 42.3	143.30	− 0.06	0.0066686	+18.9	18 43 23.23
11	162	80 4 39.2	4 1.0	143.27	+ 0.07	0.0067131	18.3	18 39 27.32
12	163	81 1 57.3	1 18.8	143.24	0.21	0.0067562	17.7	18 35 31.41
13	164	81 59 14.6	58 36.0	143.21	+ 0.33	0.0067980	+17.1	18 31 35.50
14	165	82 56 31.2	55 52.5	143.18	0.44	0.0068384	16.5	18 27 39.58
15	166	83 53 47.4	53 8.5	143.16	0.54	0.0068775	15.9	18 23 43.67
16	167	84 51 3.2	50 24.0	143.14	+ 0.63	0.0069152	+15.2	18 19 47.76
17	168	85 48 18.6	47 39.3	143.13	0.69	0.0069514	14.5	18 15 51.85
18	169	86 45 33.7	44 54.2	143.12	0.70	0.0069860	13.8	18 11 55.94
19	170	87 42 48.6	42 9.0	143.11	+ 0.68	0.0070187	+13.1	18 8 0.03
20	171	88 40 3.4	39 23.6	143.11	0.64	0.0070495	12.4	18 4 4.12
21	172	89 37 18.1	36 38.1	143.10	0.56	0.0070783	11.6	18 0 8.20
22	173	90 34 32.6	33 52.5	143.10	+ 0.46	0.0071049	+10.7	17 56 12.29
23	174	91 31 47.1	31 6.8	143.09	0.33	0.0071290	9.6	17 52 16.38
24	175	92 29 1.4	28 21.0	143.09	0.19	0.0071508	8.5	17 48 20.47
25	176	93 26 15.6	25 35.0	143.08	+ 0.05	0.0071700	+ 7.4	17 44 24.56
26	177	94 23 29.7	22 48.8	143.08	− 0.10	0.0071865	6.3	17 40 28.64
27	178	95 20 43.5	20 2.5	143.07	0.22	0.0072004	5.2	17 36 32.73
28	179	96 17 57.1	17 15.9	143.06	− 0.34	0.0072117	+ 4.2	17 32 36.82
29	180	97 15 10.5	14 29.1	143.05	0.42	0.0072204	3.1	17 28 40.91
30	181	98 12 23.5	11 42.0	143.04	0.48	0.0072265	2.1	17 24 45.00
31	182	99 9 36.3	8 54.6	143.03	− 0.53	0.0072302	+ 1.1	17 20 49.09
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^d.0$.								Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 13.7	15 8.7	55 46.8	−1.61	55 28.1	−1.49	3 25.9	2.00	3.9
2	15 4.0	14 59.9	55 11.0	1.34	54 55.9	1.18	4 12.4	1.87	4.9
3	14 56.3	14 53.4	54 42.8	0.99	54 32.1	0.79	4 56.2	1.78	5.9
4	14 51.3	14 49.8	54 24.0	−0.58	54 18.3	−0.37	5 38.2	1.73	6.9
5	14 48.7	14 48.5	54 14.8	−0.15	54 14.2	+0.05	6 19.3	1.71	7.9
6	14 49.1	14 50.3	54 16.2	+0.27	54 20.7	0.48	7 0.5	1.73	8.9
7	14 52.2	14 54.7	54 27.6	+0.67	54 36.8	+0.85	7 42.7	1.79	9.9
8	14 57.8	15 1.4	54 48.2	1.03	55 1.5	1.18	8 26.9	1.89	10.9
9	15 5.5	15 10.0	55 16.4	1.31	55 32.9	1.41	9 13.6	2.01	11.9
10	15 14.8	15 19.8	55 50.5	+1.50	56 8.9	+1.56	10 3.4	2.14	12.9
11	15 24.9	15 30.1	56 27.8	1.58	56 46.9	1.59	10 56.2	2.26	13.9
12	15 35.3	15 40.3	57 5.9	1.56	57 24.5	1.51	11 51.4	2.33	14.9
13	15 45.2	15 49.7	57 42.2	+1.43	57 58.9	+1.34	12 47.8	2.36	15.9
14	15 53.9	15 57.7	58 14.4	1.23	58 28.3	1.10	13 44.0	2.32	16.9
15	16 1.1	16 4.0	58 40.7	0.96	58 51.4	0.82	14 39.0	2.25	17.9
16	16 6.5	16 8.4	59 0.4	+0.68	59 7.6	+0.53	15 32.2	2.18	18.9
17	16 9.9	16 11.0	59 13.2	0.40	59 17.2	0.26	16 23.8	2.12	19.9
18	16 11.7	16 11.9	59 19.6	+0.14	59 20.5	+0.02	17 14.3	2.10	20.9
19	16 11.8	16 11.4	59 20.1	−0.09	59 18.4	−0.19	18 4.8	2.11	21.9
20	16 10.6	16 9.4	59 15.5	0.29	59 11.3	0.39	18 55.9	2.16	22.9
21	16 8.0	16 6.2	59 6.0	0.49	58 59.5	0.59	19 48.6	2.23	23.9
22	16 4.1	16 1.7	58 51.8	−0.69	58 42.9	−0.79	20 43.0	2.31	24.9
23	15 58.9	15 55.8	58 32.8	0.89	58 21.4	0.99	21 39.1	2.36	25.9
24	15 52.4	15 48.7	58 8.9	1.09	57 55.3	1.18	22 35.7	2.36	26.9
25	15 44.7	15 40.5	57 40.6	−1.26	57 25.0	−1.33	23 31.7	2.30	27.9
26	15 36.0	15 31.4	57 8.7	1.39	56 51.7	1.43	☌		28.9
27	15 26.7	15 21.9	56 34.4	1.45	56 16.9	1.45	0 25.8	2.20	0.4
28	15 17.3	15 12.7	55 59.7	−1.42	55 42.8	−1.38	1 17.0	2.07	1.4
29	15 8.2	15 4.1	55 26.6	1.30	55 11.5	1.21	2 5.0	1.94	2.4
30	15 0.3	14 57.0	54 57.5	1.10	54 45.1	0.96	2 50.3	1.83	3.4
31	14 54.0	14 51.7	54 34.4	−0.81	54 25.7	−0.63	3 33.3	1.76	4.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 1.					**SUNDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 57 19.25	2.1160	N.16 46 0.8	8.064	0	9 33 31.01	1.9090	N. 9 12 45.4	10.487
1	7 59 26.05	2.1108	16 37 54.8	8.136	1	9 35 25.46	1.9059	9 2 15.3	10.518
2	8 1 32.54	2.1056	16 29 44.5	8.208	2	9 37 19.72	1.9028	8 51 43.3	10.548
3	8 3 38.72	2.1004	16 21 29.9	8.278	3	9 39 13.80	1.8998	8 41 9.6	10.577
4	8 5 44.59	2.0953	16 13 11.2	8.346	4	9 41 7.70	1.8968	8 30 34.1	10.605
5	8 7 50.16	2.0902	16 4 48.4	8.414	5	9 43 1.42	1.8939	8 19 57.0	10.632
6	8 9 55.42	2.0852	15 56 21.5	8.482	6	9 44 54.97	1.8912	8 9 18.3	10.659
7	8 12 0.38	2.0801	15 47 50.6	8.548	7	9 46 48.36	1.8884	7 58 37.9	10.686
8	8 14 5.03	2.0750	15 39 15.8	8.613	8	9 48 41.58	1.8857	7 47 56.0	10.711
9	8 16 9.38	2.0701	15 30 37.1	8.677	9	9 50 34.64	1.8830	7 37 12.6	10.736
10	8 18 13.44	2.0652	15 21 54.6	8.739	10	9 52 27.54	1.8804	7 26 27.7	10.760
11	8 20 17.20	2.0602	15 13 8.4	8.802	11	9 54 20.29	1.8779	7 15 41.4	10.783
12	8 22 20.67	2.0554	15 4 18.4	8.863	12	9 56 12.89	1.8754	7 4 53.7	10.806
13	8 24 23.85	2.0505	14 55 24.8	8.923	13	9 58 5.34	1.8730	6 54 4.7	10.828
14	8 26 26.73	2.0457	14 46 27.6	8.983	14	9 59 57.65	1.8707	6 43 14.3	10.850
15	8 28 29.33	2.0409	14 37 26.9	9.041	15	10 1 49.82	1.8683	6 32 22.7	10.870
16	8 30 31.64	2.0362	14 28 22.7	9.099	16	10 3 41.85	1.8661	6 21 29.9	10.890
17	8 32 33.67	2.0316	14 19 15.0	9.156	17	10 5 33.75	1.8639	6 10 35.9	10.910
18	8 34 35.43	2.0269	14 10 4.0	9.211	18	10 7 25.52	1.8618	5 59 40.7	10.929
19	8 36 36.90	2.0223	14 0 49.7	9.266	19	10 9 17.17	1.8598	5 48 44.4	10.948
20	8 38 38.10	2.0177	13 51 32.1	9.320	20	10 11 8.69	1.8577	5 37 47.0	10.966
21	8 40 39.02	2.0132	13 42 11.3	9.373	21	10 13 0.09	1.8558	5 26 48.5	10.983
22	8 42 39.68	2.0088	13 32 47.3	9.425	22	10 14 51.38	1.8539	5 15 49.1	10.998
23	8 44 40.07	2.0042	N.13 23 20.3	9.476	23	10 16 42.56	1.8521	N. 5 4 48.7	11.014
	SATURDAY 2.					**MONDAY 4.**			
0	8 46 40.19	1.9998	N.13 13 50.2	9.527	0	10 18 33.63	1.8503	N. 4 53 47.4	11.029
1	8 48 40.05	1.9955	13 4 17.1	9.576	1	10 20 24.60	1.8486	4 42 45.2	11.043
2	8 50 39.65	1.9912	12 54 41.1	9.624	2	10 22 15.46	1.8469	4 31 42.2	11.058
3	8 52 38.99	1.9869	12 45 2.2	9.672	3	10 24 6.23	1.8453	4 20 38.3	11.071
4	8 54 38.08	1.9827	12 35 20.5	9.718	4	10 25 56.90	1.8438	4 9 33.7	11.083
5	8 56 36.91	1.9785	12 25 36.0	9.765	5	10 27 47.49	1.8424	3 58 28.3	11.096
6	8 58 35.50	1.9744	12 15 48.7	9.810	6	10 29 37.99	1.8410	3 47 22.2	11.108
7	9 0 33.84	1.9703	12 5 58.8	9.854	7	10 31 28.41	1.8397	3 36 15.4	11.118
8	9 2 31.94	1.9663	11 56 6.2	9.898	8	10 33 18.75	1.8384	3 25 8.0	11.128
9	9 4 29.80	1.9624	11 46 11.0	9.941	9	10 35 9.02	1.8372	3 14 0.0	11.138
10	9 6 27.43	1.9585	11 36 13.3	9.983	10	10 36 59.21	1.8360	3 2 51.5	11.147
11	9 8 24.82	1.9545	11 26 13.1	10.023	11	10 38 49.34	1.8350	2 51 42.4	11.155
12	9 10 21.97	1.9507	11 16 10.5	10.063	12	10 40 39.41	1.8340	2 40 32.9	11.163
13	9 12 18.90	1.9470	11 6 5.5	10.103	13	10 42 29.42	1.8330	2 29 22.9	11.170
14	9 14 15.61	1.9433	10 55 58.1	10.143	14	10 44 19.37	1.8321	2 18 12.5	11.177
15	9 16 12.09	1.9395	10 45 48.3	10.180	15	10 46 9.27	1.8312	2 7 1.7	11.183
16	9 18 8.35	1.9359	10 35 36.4	10.217	16	10 47 59.12	1.8304	1 55 50.5	11.189
17	9 20 4.40	1.9324	10 25 22.3	10.253	17	10 49 48.92	1.8298	1 44 39.0	11.194
18	9 22 0.24	1.9289	10 15 6.0	10.289	18	10 51 38.69	1.8291	1 33 27.1	11.198
19	9 23 55.87	1.9255	10 4 47.6	10.324	19	10 53 28.41	1.8284	1 22 15.1	11.203
20	9 25 51.30	1.9221	9 54 27.1	10.358	20	10 55 18.10	1.8280	1 11 2.8	11.206
21	9 27 46.52	1.9187	9 44 4.6	10.392	21	10 57 7.77	1.8276	0 59 50.4	11.208
22	9 29 41.55	1.9155	9 33 40.1	10.424	22	10 58 57.41	1.8271	0 48 37.9	11.210
23	9 31 36.38	1.9122	9 23 13.7	10.456	23	11 0 47.02	1.8267	0 37 25.2	11.212
24	9 33 31.01	1.9090	N. 9 12 45.4	10.487	24	11 2 36.61	1.8264	N. 0 26 12.5	11.213

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 5.					THURSDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 2 36.61	1.8264	N. 0 26 12.5	11.213	0	12 31 6.44	1.8838	S. 8 22 3.1	10.568
1	11 4 26.19	1.8262	0 14 59.7	11.213	1	12 32 59.55	1.8865	8 32 36.3	10.538
2	11 6 15.76	1.8261	N. 0 3 46.9	11.213	2	12 34 52.82	1.8892	8 43 7.7	10.508
3	11 8 5.32	1.8259	S. 0 7 25.8	11.212	3	12 36 46.25	1.8919	8 53 37.3	10.478
4	11 9 54.87	1.8259	0 18 38.5	11.211	4	12 38 39.85	1.8947	9 4 5.1	10.448
5	11 11 44.43	1.8260	0 29 51.1	11.208	5	12 40 33.62	1.8976	9 14 31.1	10.417
6	11 13 33.99	1.8260	0 41 3.5	11.206	6	12 42 27.56	1.9005	9 24 55.1	10.384
7	11 15 23.55	1.8261	0 52 15.8	11.203	7	12 44 21.68	1.9035	9 35 17.2	10.352
8	11 17 13.12	1.8263	1 3 27.9	11.200	8	12 46 15.98	1.9065	9 45 37.3	10.318
9	11 19 2.71	1.8267	1 14 39.8	11.196	9	12 48 10.46	1.9095	9 55 55.4	10.284
10	11 20 52.32	1.8270	1 25 51.4	11.191	10	12 50 5.12	1.9126	10 6 11.4	10.248
11	11 22 41.95	1.8273	1 37 2.7	11.185	11	12 51 59.97	1.9157	10 16 25.2	10.213
12	11 24 31.60	1.8278	1 48 13.6	11.179	12	12 53 55.01	1.9190	10 26 36.9	10.177
13	11 26 21.28	1.8283	1 59 24.2	11.173	13	12 55 50.25	1.9222	10 36 46.4	10.139
14	11 28 11.00	1.8289	2 10 34.3	11.165	14	12 57 45.68	1.9255	10 46 53.6	10.101
15	11 30 0.75	1.8295	2 21 44.0	11.158	15	12 59 41.31	1.9289	10 56 58.5	10.063
16	11 31 50.54	1.8302	2 32 53.2	11.149	16	13 1 37.15	1.9324	11 7 1.1	10.023
17	11 33 40.38	1.8310	2 44 1.9	11.141	17	13 3 33.20	1.9358	11 17 1.3	9.983
18	11 35 30.26	1.8318	2 55 10.1	11.132	18	13 5 29.45	1.9393	11 26 59.1	9.943
19	11 37 20.19	1.8327	3 6 17.7	11.122	19	13 7 25.92	1.9429	11 36 54.4	9.900
20	11 39 10.18	1.8336	3 17 24.7	11.111	20	13 9 22.60	1.9465	11 46 47.2	9.858
21	11 41 0.22	1.8345	3 28 31.0	11.100	21	13 11 19.50	1.9502	11 56 37.4	9.814
22	11 42 50.32	1.8356	3 39 36.7	11.088	22	13 13 16.62	1.9538	12 6 24.9	9.770
23	11 44 40.49	1.8367	S. 3 50 41.6	11.075	23	13 15 13.96	1.9576	S. 12 16 9.8	9.725
	WEDNESDAY 6.					FRIDAY 8.			
0	11 46 30.73	1.8379	S. 4 1 45.7	11.063	0	13 17 11.53	1.9614	S. 12 25 51.9	9.679
1	11 48 21.04	1.8392	4 12 49.1	11.049	1	13 19 9.33	1.9652	12 35 31.3	9.633
2	11 50 11.43	1.8405	4 23 51.6	11.035	2	13 21 7.36	1.9692	12 45 7.9	9.586
3	11 52 1.90	1.8418	4 34 53.3	11.021	3	13 23 5.63	1.9731	12 54 41.6	9.538
4	11 53 52.45	1.8432	4 45 54.1	11.005	4	13 25 4.13	1.9770	13 4 12.4	9.488
5	11 55 43.09	1.8447	4 56 53.9	10.989	5	13 27 2.87	1.9810	13 13 40.2	9.438
6	11 57 33.82	1.8463	5 7 52.8	10.973	6	13 29 1.85	1.9851	13 23 5.0	9.388
7	11 59 24.65	1.8479	5 18 50.6	10.955	7	13 31 1.08	1.9892	13 32 26.8	9.338
8	12 1 15.57	1.8495	5 29 47.4	10.938	8	13 33 0.55	1.9932	13 41 45.5	9.285
9	12 3 6.59	1.8512	5 40 43.2	10.920	9	13 35 0.27	1.9975	13 51 1.0	9.232
10	12 4 57.72	1.8531	5 51 37.8	10.900	10	13 37 0.25	2.0017	14 0 13.3	9.178
11	12 6 48.96	1.8548	6 2 31.2	10.880	11	13 39 0.48	2.0059	14 9 22.4	9.123
12	12 8 40.30	1.8567	6 13 23.4	10.860	12	13 41 0.96	2.0102	14 18 28.1	9.068
13	12 10 31.76	1.8587	6 24 14.4	10.840	13	13 43 1.70	2.0145	14 27 30.5	9.011
14	12 12 23.34	1.8607	6 35 4.2	10.818	14	13 45 2.70	2.0189	14 36 29.4	8.953
15	12 14 15.05	1.8628	6 45 52.6	10.796	15	13 47 3.97	2.0233	14 45 24.9	8.896
16	12 16 6.88	1.8649	6 56 39.7	10.773	16	13 49 5.50	2.0278	14 54 16.9	8.837
17	12 17 58.84	1.8671	7 7 25.4	10.749	17	13 51 7.30	2.0322	15 3 5.3	8.776
18	12 19 50.93	1.8693	7 18 9.6	10.725	18	13 53 9.36	2.0367	15 11 50.0	8.715
19	12 21 43.15	1.8716	7 28 52.4	10.701	19	13 55 11.70	2.0413	15 20 31.1	8.653
20	12 23 35.52	1.8740	7 39 33.7	10.676	20	13 57 14.31	2.0458	15 29 8.4	8.591
21	12 25 28.03	1.8763	7 50 13.5	10.650	21	13 59 17.20	2.0504	15 37 42.0	8.528
22	12 27 20.68	1.8788	8 0 51.7	10.623	22	14 1 20.36	2.0549	15 46 11.7	8.463
23	12 29 13.49	1.8813	8 11 28.2	10.595	23	14 3 23.79	2.0596	15 54 37.5	8.397
24	12 31 6.44	1.8838	S. 8 22 3.1	10.568	24	14 5 27.51	2.0643	S. 16 2 59.3	8.330

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 9.					MONDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 5 27.51	2.0643	S.16 2 59.3	8.330	0	15 50 7.77	2.2946	S.21 8 28.1	4.033
1	14 7 31.51	2.0690	16 11 17.1	8.263	1	15 52 25.58	2.2989	21 12 26.7	3.920
2	14 9 35.79	2.0737	16 19 30.9	8.196	2	15 54 43.64	2.3032	21 16 18.5	3.807
3	14 11 40.35	2.0784	16 27 40.6	8.127	3	15 57 1.96	2.3074	21 20 3.5	3.693
4	14 13 45.20	2.0832	16 35 46.1	8.056	4	15 59 20.53	2.3116	21 23 41.7	3.579
5	14 15 50.34	2.0880	16 43 47.3	7.985	5	16 1 39.35	2.3157	21 27 13.0	3.463
6	14 17 55.76	2.0928	16 51 44.3	7.913	6	16 3 58.41	2.3197	21 30 37.3	3.347
7	14 20 1.47	2.0977	16 59 36.9	7.841	7	16 6 17.72	2.3238	21 33 54.7	3.229
8	14 22 7.48	2.1025	17 7 25.2	7.768	8	16 8 37.27	2.3278	21 37 4.9	3.111
9	14 24 13.77	2.1073	17 15 9.0	7.692	9	16 10 57.06	2.3317	21 40 8.0	2.993
10	14 26 20.36	2.1122	17 22 48.2	7.616	10	16 13 17.08	2.3356	21 43 4.0	2.873
11	14 28 27.23	2.1170	17 30 22.9	7.540	11	16 15 37.33	2.3394	21 45 52.8	2.753
12	14 30 34.40	2.1219	17 37 53.0	7.463	12	16 17 57.81	2.3432	21 48 34.4	2.633
13	14 32 41.86	2.1268	17 45 18.4	7.383	13	16 20 18.51	2.3468	21 51 8.7	2.510
14	14 34 49.62	2.1318	17 52 39.0	7.304	14	16 22 39.43	2.3504	21 53 35.6	2.388
15	14 36 57.68	2.1367	17 59 54.9	7.224	15	16 25 0.56	2.3540	21 55 55.2	2.265
16	14 39 6.03	2.1417	18 7 5.9	7.143	16	16 27 21.91	2.3575	21 58 7.4	2.141
17	14 41 14.68	2.1466	18 14 12.0	7.060	17	16 29 43.46	2.3609	22 0 12.1	2.017
18	14 43 23.62	2.1515	18 21 13.1	6.976	18	16 32 5.22	2.3643	22 2 9.4	1.892
19	14 45 32.86	2.1565	18 28 9.2	6.892	19	16 34 27.18	2.3676	22 3 59.1	1.766
20	14 47 42.40	2.1614	18 35 0.2	6.807	20	16 36 49.33	2.3708	22 5 41.3	1.640
21	14 49 52.23	2.1663	18 41 46.0	6.720	21	16 39 11.67	2.3738	22 7 15.9	1.513
22	14 52 2.36	2.1713	18 48 26.6	6.633	22	16 41 34.19	2.3769	22 8 42.9	1.386
23	14 54 12.79	2.1763	S.18 55 2.0	6.545	23	16 43 56.90	2.3799	S.22 10 2.2	1.258
	SUNDAY 10.					TUESDAY 12.			
0	14 56 23.52	2.1812	S.19 1 32.0	6.456	0	16 46 19.78	2.3828	S.22 11 13.8	1.129
1	14 58 34.54	2.1862	19 7 56.7	6.366	1	16 48 42.84	2.3857	22 12 17.7	1.000
2	15 0 45.86	2.1911	19 14 15.9	6.274	2	16 51 6.06	2.3883	22 13 13.8	0.870
3	15 2 57.47	2.1960	19 20 29.6	6.183	3	16 53 29.44	2.3910	22 14 2.1	0.740
4	15 5 9.38	2.2009	19 26 37.8	6.090	4	16 55 52.98	2.3937	22 14 42.6	0.609
5	15 7 21.58	2.2058	19 32 40.4	5.996	5	16 58 16.68	2.3962	22 15 15.2	0.478
6	15 9 34.08	2.2107	19 38 37.3	5.901	6	17 0 40.52	2.3986	22 15 40.0	0.348
7	15 11 46.87	2.2156	19 44 28.5	5.805	7	17 3 4.51	2.4009	22 15 56.9	0.216
8	15 13 59.95	2.2204	19 50 13.9	5.708	8	17 5 28.63	2.4032	22 16 5.9	− 0.083
9	15 16 13.32	2.2252	19 55 53.4	5.610	9	17 7 52.89	2.4054	22 16 6.9	+ 0.050
10	15 18 26.98	2.2300	20 1 27.1	5.512	10	17 10 17.28	2.4075	22 15 59.9	0.183
11	15 20 40.92	2.2348	20 6 54.8	5.412	11	17 12 41.79	2.4094	22 15 45.0	0.315
12	15 22 55.16	2.2397	20 12 16.5	5.312	12	17 15 6.41	2.4113	22 15 22.1	0.449
13	15 25 9.68	2.2444	20 17 32.2	5.210	13	17 17 31.15	2.4132	22 14 51.1	0.583
14	15 27 24.49	2.2492	20 22 41.7	5.107	14	17 19 56.00	2.4149	22 14 12.1	0.717
15	15 29 39.58	2.2538	20 27 45.0	5.003	15	17 22 20.94	2.4165	22 13 25.1	0.851
16	15 31 54.95	2.2584	20 32 42.1	4.899	16	17 24 45.98	2.4182	22 12 30.0	0.986
17	15 34 10.59	2.2631	20 37 32.9	4.794	17	17 27 11.12	2.4198	22 11 26.8	1.121
18	15 36 26.52	2.2677	20 42 17.4	4.688	18	17 29 36.35	2.4211	22 10 15.5	1.256
19	15 38 42.72	2.2722	20 46 55.5	4.582	19	17 32 1.65	2.4223	22 8 56.1	1.391
20	15 40 59.19	2.2768	20 51 27.2	4.473	20	17 34 27.03	2.4236	22 7 28.6	1.526
21	15 43 15.94	2.2813	20 55 52.3	4.364	21	17 36 52.48	2.4247	22 5 53.0	1.661
22	15 45 32.95	2.2857	21 0 10.9	4.254	22	17 39 17.99	2.4257	22 4 9.3	1.797
23	15 47 50.23	2.2902	21 4 22.8	4.143	23	17 41 43.56	2.4267	22 2 17.4	1.933
24	15 50 7.77	2.2946	S.21 8 28.1	4.033	24	17 44 9.19	2.4275	S.22 0 17.4	2.068

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 13.					FRIDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 44 9.19	2.4275	S.22 0 17.4	2.068	0	19 40 5.62	2.3764	S.17 49 26.0	8.189
1	17 46 34.86	2.4283	21 58 9.3	2.203	1	19 42 28.13	2.3739	17 41 11.3	8.300
2	17 49 0.58	2.4290	21 55 53.0	2.339	2	19 44 50.49	2.3713	17 32 50.0	8.410
3	17 51 26.34	2.4296	21 53 28.6	2.475	3	19 47 12.69	2.3688	17 24 22.1	8.520
4	17 53 52.13	2.4300	21 50 56.0	2.611	4	19 49 34.74	2.3662	17 15 47.6	8.628
5	17 56 17.94	2.4304	21 48 15.3	2.746	5	19 51 56.63	2.3636	17 7 6.7	8.735
6	17 58 43.78	2.4308	21 45 26.5	2.881	6	19 54 18.37	2.3609	16 58 19.4	8.841
7	18 1 9.64	2.4311	21 42 29.6	3.016	7	19 56 39.94	2.3582	16 49 25.7	8.946
8	18 3 35.51	2.4312	21 39 24.6	3.151	8	19 59 1.35	2.3555	16 40 25.8	9.050
9	18 6 1.38	2.4312	21 36 11.5	3.286	9	20 1 22.60	2.3528	16 31 19.7	9.153
10	18 8 27.25	2.4312	21 32 50.3	3.421	10	20 3 43.69	2.3501	16 22 7.5	9.255
11	18 10 53.12	2.4311	21 29 21.0	3.556	11	20 6 4.61	2.3473	16 12 49.1	9.357
12	18 13 18.98	2.4309	21 25 43.6	3.690	12	20 8 25.37	2.3446	16 3 24.7	9.457
13	18 15 44.83	2.4306	21 21 58.2	3.824	13	20 10 45.96	2.3418	15 53 54.3	9.555
14	18 18 10.65	2.4302	21 18 4.7	3.958	14	20 13 6.38	2.3389	15 44 18.1	9.652
15	18 20 36.45	2.4298	21 14 3.2	4.092	15	20 15 26.63	2.3361	15 34 36.1	9.748
16	18 23 2.23	2.4293	21 9 53.7	4.224	16	20 17 46.71	2.3333	15 24 48.3	9.844
17	18 25 27.97	2.4287	21 5 36.3	4.357	17	20 20 6.63	2.3305	15 14 54.8	9.939
18	18 27 53.67	2.4280	21 1 10.9	4.490	18	20 22 26.37	2.3277	15 4 55.7	10.032
19	18 30 19.33	2.4272	20 56 37.5	4.623	19.	20 24 45.95	2.3248	14 54 51.0	10.124
20	18 32 44.94	2.4263	20 51 56.2	4.753	20	20 27 5.35	2.3219	14 44 40.8	10.215
21	18 35 10.49	2.4254	20 47 7.1	4.884	21	20 29 24.58	2.3192	14 34 25.2	10.304
22	18 37 35.99	2.4245	20 42 10.1	5.016	22	20 31 43.65	2.3163	14 24 4.3	10.393
23	18 40 1.43	2.4234	S.20 37 5.2	5.146	23	20 34 2.54	2.3134	S.14 13 38.1	10.480
	THURSDAY 14.					SATURDAY 16.			
0	18 42 26.80	2.4223	S.20 31 52.6	5.275	0	20 36 21.26	2.3106	S.14 3 6.7	10.566
1	18 44 52.10	2.4210	20 26 32.2	5.404	1	20 38 39.81	2.3078	13 52 30.2	10.651
2	18 47 17.32	2.4198	20 21 4.1	5.533	2	20 40 58.19	2.3049	13 41 48.6	10.735
3	18 49 42.47	2.4184	20 15 28.2	5.662	3	20 43 16.40	2.3022	13 31 2.0	10.818
4	18 52 7.53	2.4169	20 9 44.7	5.789	4	20 45 34.45	2.2993	13 20 10.5	10.898
5	18 54 32.50	2.4154	20 3 53.5	5.917	5	20 47 52.32	2.2965	13 9 14.2	10.978
6	18 56 57.38	2.4139	19 57 54.7	6.043	6	20 50 10.03	2.2938	12 58 13.1	11.058
7	18 59 22.17	2.4123	19 51 48.4	6.168	7	20 52 27.57	2.2909	12 47 7.3	11.135
8	19 1 46.86	2.4106	19 45 34.5	6.293	8	20 54 44.94	2.2882	12 35 56.9	11.211
9	19 4 11.44	2.4088	19 39 13.2	6.418	9	20 57 2.15	2.2855	12 24 42.0	11.286
10	19 6 35.92	2.4071	19 32 44.4	6.542	10	20 59 19.20	2.2827	12 13 22.6	11.360
11	19 9 0.29	2.4052	19 26 8.2	6.664	11	21 1 36.08	2.2799	12 1 58.8	11.433
12	19 11 24.54	2.4033	19 19 24.7	6.786	12	21 3 52.79	2.2773	11 50 30.6	11.505
13	19 13 48.68	2.4013	19 12 33.9	6.908	13	21 6 9.35	2.2747	11 38 58.2	11.574
14	19 16 12.70	2.3993	19 5 35.8	7.029	14	21 8 25.75	2.2720	11 27 21.7	11.643
15	19 18 36.59	2.3972	18 58 30.4	7.149	15	21 10 41.99	2.2694	11 15 41.1	11.711
16	19 21 0.36	2.3951	18 51 17.9	7.268	16	21 12 58.08	2.2668	11 3 56.4	11.778
17	19 23 24.00	2.3929	18 43 58.3	7.386	17	21 15 14.01	2.2643	10 52 7.8	11.843
18	19 25 47.51	2.3907	18 36 31.6	7.503	18	21 17 29.79	2.2618	10 40 15.2	11.906
19	19 28 10.88	2.3883	18 28 57.9	7.619	19	21 19 45.42	2.2593	10 28 19.0	11.968
20	19 30 34.11	2.3861	18 21 17.3	7.735	20	21 22 0.90	2.2568	10 16 19.0	12.030
21	19 32 57.21	2.3838	18 13 29.7	7.851	21	21 24 16.23	2.2543	10 4 15.4	12.089
22	19 35 20.16	2.3813	18 5 35.2	7.964	22	21 26 31.42	2.2520	9 52 8.3	12.148
23	19 37 42.96	2.3788	17 57 34.0	8.077	23	21 28 46.47	2.2496	9 39 57.6	12.206
24	19 40 5.62	2.3764	S.17 49 26.0	8.189	24	21 31 1.37	2.2472	S. 9 27 43.6	12.262

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 17.					TUESDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 31 1.37	2.2472	S. 9 27 43.6	12.262	0	23 17 3.54	2.1911	N. 1 0 53.5	13.434
1	21 33 16.13	2.2449	9 15 26.2	12.317	1	23 19 15.01	2.1913	1 14 19.3	13.427
2	21 35 30.76	2.2427	9 3 5.6	12.370	2	23 21 26.49	2.1915	1 27 44.7	13.418
3	21 37 45.25	2.2404	8 50 41.8	12.423	3	23 23 37.99	2.1918	1 41 9.5	13.408
4	21 39 59.61	2.2383	8 38 14.9	12.473	4	23 25 49.50	2.1921	1 54 33.7	13.398
5	21 42 13.84	2.2362	8 25 45.0	12.523	5	23 28 1.04	2.1926	2 7 57.2	13.386
6	21 44 27.95	2.2341	8 13 12.1	12.572	6	23 30 12.61	2.1931	2 21 20.0	13.373
7	21 46 41.93	2.2320	8 0 36.4	12.618	7	23 32 24.21	2.1936	2 34 41.9	13.357
8	21 48 55.79	2.2300	7 47 57.9	12.664	8	23 34 35.84	2.1942	2 48 2.8	13.341
9	21 51 9.53	2.2280	7 35 16.7	12.708	9	23 36 47.51	2.1948	3 1 22.8	13.324
10	21 53 23.15	2.2261	7 22 32.9	12.752	10	23 38 59.22	2.1955	3 14 41.7	13.305
11	21 55 36.66	2.2242	7 9 46.5	12.794	11	23 41 10.97	2.1963	3 27 59.4	13.286
12	21 57 50.05	2.2223	6 56 57.6	12.834	12	23 43 22.77	2.1971	3 41 16.0	13.265
13	22 0 3.33	2.2205	6 44 6.4	12.873	13	23 45 34.62	2.1980	3 54 31.2	13.242
14	22 2 16.51	2.2188	6 31 12.8	12.912	14	23 47 46.53	2.1989	4 7 45.0	13.218
15	22 4 29.58	2.2171	6 18 17.0	12.948	15	23 49 58.49	2.1999	4 20 57.4	13.193
16	22 6 42.56	2.2155	6 5 19.0	12.983	16	23 52 10.52	2.2010	4 34 8.2	13.168
17	22 8 55.44	2.2138	5 52 19.0	13.018	17	23 54 22.61	2.2021	4 47 17.5	13.140
18	22 11 8.22	2.2123	5 39 16.9	13.051	18	23 56 34.77	2.2033	5 0 25.0	13.111
19	22 13 20.91	2.2108	5 26 12.9	13.083	19	23 58 47.00	2.2044	5 13 30.8	13.082
20	22 15 33.51	2.2093	5 13 7.0	13.113	20	0 0 59.30	2.2058	5 26 34.8	13.050
21	22 17 46.02	2.2078	4 59 59.4	13.142	21	0 3 11.69	2.2071	5 39 36.8	13.018
22	22 19 58.45	2.2066	4 46 50.0	13.169	22	0 5 24.15	2.2083	5 52 36.9	12.984
23	22 22 10.81	2.2053	S. 4 33 39.1	13.195	23	0 7 36.69	2.2098	N. 6 5 34.9	12.948
	MONDAY 18.					WEDNESDAY 20.			
0	22 24 23.08	2.2039	S. 4 20 26.6	13.221	0	0 9 49.32	2.2113	N. 6 18 30.7	12.912
1	22 26 35.28	2.2028	4 7 12.6	13.244	1	0 12 2.04	2.2128	6 31 24.3	12.875
2	22 28 47.42	2.2018	3 53 57.3	13.266	2	0 14 14.86	2.2144	6 44 15.7	12.837
3	22 30 59.49	2.2006	3 40 40.7	13.287	3	0 16 27.77	2.2160	6 57 4.7	12.796
4	22 33 11.49	2.1995	3 27 22.9	13.307	4	0 18 40.78	2.2177	7 9 51.2	12.754
5	22 35 23.43	2.1986	3 14 3.9	13.326	5	0 20 53.89	2.2194	7 22 35.2	12.712
6	22 37 35.32	2.1978	3 0 43.8	13.343	6	0 23 7.11	2.2213	7 35 16.7	12.669
7	22 39 47.16	2.1968	2 47 22.7	13.359	7	0 25 20.44	2.2231	7 47 55.5	12.623
8	22 41 58.94	2.1960	2 34 0.7	13.374	8	0 27 33.88	2.2249	8 0 31.5	12.577
9	22 44 10.68	2.1953	2 20 37.8	13.388	9	0 29 47.43	2.2268	8 13 4.7	12.530
10	22 46 22.38	2.1946	2 7 14.2	13.399	10	0 32 1.10	2.2288	8 25 35.1	12.481
11	22 48 34.03	2.1939	1 53 49.9	13.410	11	0 34 14.88	2.2307	8 38 2.4	12.430
12	22 50 45.65	2.1934	1 40 25.0	13.419	12	0 36 28.78	2.2328	8 50 26.7	12.379
13	22 52 57.24	2.1929	1 26 59.5	13.428	13	0 38 42.81	2.2349	9 2 47.9	12.327
14	22 55 8.80	2.1924	1 13 33.6	13.435	14	0 40 56.97	2.2370	9 15 5.9	12.273
15	22 57 20.33	2.1920	1 0 7.3	13.441	15	0 43 11.25	2.2392	9 27 20.7	12.219
16	22 59 31.84	2.1917	0 46 40.7	13.445	16	0 45 25.67	2.2415	9 39 32.2	12.163
17	23 1 43.33	2.1914	0 33 13.9	13.448	17	0 47 40.23	2.2438	9 51 40.2	12.104
18	23 3 54.81	2.1912	0 19 47.0	13.449	18	0 49 54.92	2.2460	10 3 44.7	12.046
19	23 6 6.27	2.1910	S. 0 6 20.0	13.450	19	0 52 9.75	2.2483	10 15 45.7	11.986
20	23 8 17.73	2.1909	N. 0 7 7.0	13.449	20	0 54 24.72	2.2507	10 27 43.0	11.924
21	23 10 29.18	2.1908	0 20 33.9	13.448	21	0 56 39.83	2.2531	10 39 36.6	11.863
22	23 12 40.63	2.1908	0 34 0.7	13.444	22	0 58 55.09	2.2556	10 51 26.5	11.799
23	23 14 52.08	2.1909	0 47 27.2	13.440	23	1 1 10.50	2.2581	11 3 12.5	11.733
24	23 17 3.54	2.1911	N. 1 0 53.5	13.434	24	1 3 26.06	2.2606	N. 11 14 54.5	11.668

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 21.					SATURDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 3 26.06	2.2606	N.11 14 54.5	11.668	0	2 55 7.86	2.3925	N.18 56 45.9	7.160
1	1 5 41.77	2.2631	11 26 32.6	11.601	1	2 57 31.48	2.3949	19 3 52.0	7.043
2	1 7 57.63	2.2656	11 38 6.6	11.532	2	2 59 55.25	2.3972	19 10 51.0	6.923
3	1 10 13.64	2.2682	11 49 36.5	11.462	3	3 2 19.15	2.3994	19 17 42.8	6.803
4	1 12 29.81	2.2708	12 1 2.1	11.392	4	3 4 43.18	2.4017	19 24 27.3	6.682
5	1 14 46.14	2.2735	12 12 23.5	11.320	5	3 7 7.35	2.4039	19 31 4.6	6.561
6	1 17 2.63	2.2762	12 23 40.5	11.246	6	3 9 31.65	2.4060	19 37 34.6	6.438
7	1 19 19.28	2.2789	12 34 53.0	11.171	7	3 11 56.07	2.4080	19 43 57.2	6.315
8	1 21 36.10	2.2817	12 46 1.0	11.096	8	3 14 20.61	2.4100	19 50 12.4	6.191
9	1 23 53.08	2.2843	12 57 4.5	11.019	9	3 16 45.27	2.4120	19 56 20.1	6.067
10	1 26 10.22	2.2871	13 8 3.3	10.940	10	3 19 10.05	2.4139	20 2 20.4	5.942
11	1 28 27.53	2.2899	13 18 57.3	10.861	11	3 21 34.94	2.4158	20 8 13.1	5.816
12	1 30 45.01	2.2928	13 29 46.6	10.781	12	3 23 59.94	2.4175	20 13 58.3	5.690
13	1 33 2.66	2.2955	13 40 31.0	10.699	13	3 26 25.04	2.4193	20 19 35.9	5.563
14	1 35 20.47	2.2983	13 51 10.5	10.617	14	3 28 50.25	2.4209	20 25 5.8	5.434
15	1 37 38.46	2.3013	14 1 45.0	10.533	15	3 31 15.55	2.4225	20 30 28.0	5.306
16	1 39 56.62	2.3041	14 12 14.4	10.448	16	3 33 40.95	2.4240	20 35 42.5	5.177
17	1 42 14.95	2.3069	14 22 38.7	10.362	17	3 36 6.43	2.4254	20 40 49.2	5.048
18	1 44 33.45	2.3098	14 32 57.8	10.274	18	3 38 32.00	2.4268	20 45 48.2	4.918
19	1 46 52.12	2.3127	14 43 11.6	10.186	19	3 40 57.65	2.4282	20 50 39.4	4.788
20	1 49 10.97	2.3156	14 53 20.1	10.096	20	3 43 23.38	2.4294	20 55 22.7	4.656
21	1 51 29.99	2.3185	15 3 23.1	10.005	21	3 45 49.18	2.4306	20 59 58.1	4.525
22	1 53 49.19	2.3214	15 13 20.7	9.913	22	3 48 15.05	2.4318	21 4 25.7	4.394
23	1 56 8.56	2.3243	N.15 23 12.7	9.821	23	3 50 40.99	2.4328	N.21 8 45.4	4.262
	FRIDAY 22.					SUNDAY 24.			
0	1 58 28.11	2.3273	N.15 32 59.2	9.727	0	3 53 6.98	2.4337	N.21 12 57.1	4.128
1	2 0 47.83	2.3301	15 42 39.9	9.631	1	3 55 33.03	2.4346	21 17 0.8	3.995
2	2 3 7.72	2.3330	15 52 14.9	9.535	2	3 57 59.13	2.4353	21 20 56.5	3.861
3	2 5 27.79	2.3359	16 1 44.1	9.438	3	4 0 25.27	2.4360	21 24 44.1	3.727
4	2 7 48.03	2.3388	16 11 7.4	9.339	4	4 2 51.45	2.4367	21 28 23.7	3.593
5	2 10 8.45	2.3417	16 20 24.8	9.240	5	4 5 17.67	2.4373	21 31 55.4	3.459
6	2 12 29.04	2.3446	16 29 36.2	9.139	6	4 7 43.92	2.4378	21 35 18.9	3.324
7	2 14 49.80	2.3474	16 38 41.5	9.038	7	4 10 10.20	2.4381	21 38 34.3	3.189
8	2 17 10.73	2.3503	16 47 40.7	8.935	8	4 12 36.49	2.4383	21 41 41.6	3.053
9	2 19 31.83	2.3531	16 56 33.7	8.831	9	4 15 2.80	2.4386	21 44 40.7	2.918
10	2 21 53.10	2.3559	17 5 20.4	8.726	10	4 17 29.12	2.4388	21 47 31.7	2.783
11	2 24 14.54	2.3587	17 14 0.8	8.621	11	4 19 55.45	2.4388	21 50 14.6	2.648
12	2 26 36.14	2.3614	17 22 34.9	8.514	12	4 22 21.77	2.4387	21 52 49.4	2.512
13	2 28 57.91	2.3642	17 31 2.5	8.407	13	4 24 48.09	2.4386	21 55 16.0	2.375
14	2 31 19.84	2.3669	17 39 23.7	8.298	14	4 27 14.40	2.4384	21 57 34.4	2.238
15	2 33 41.94	2.3697	17 47 38.3	8.188	15	4 29 40.70	2.4381	21 59 44.6	2.103
16	2 36 4.20	2.3723	17 55 46.3	8.078	16	4 32 6.97	2.4377	22 1 46.7	1.966
17	2 38 26.62	2.3749	18 3 47.6	7.966	17	4 34 33.22	2.4372	22 3 40.5	1.829
18	2 40 49.19	2.3775	18 11 42.2	7.854	18	4 36 59.43	2.4366	22 5 26.2	1.693
19	2 43 11.92	2.3802	18 19 30.1	7.741	19	4 39 25.61	2.4359	22 7 3.7	1.558
20	2 45 34.81	2.3828	18 27 11.2	7.627	20	4 41 51.74	2.4352	22 8 33.1	1.422
21	2 47 57.85	2.3853	18 34 45.4	7.512	21	4 44 17.83	2.4343	22 9 54.3	1.285
22	2 50 21.04	2.3878	18 42 12.6	7.395	22	4 46 43.86	2.4333	22 11 7.3	1.148
23	2 52 44.38	2.3902	18 49 32.8	7.278	23	4 49 9.83	2.4323	22 12 12.1	1.013
24	2 55 7.86	2.3925	N.18 56 45.9	7.160	24	4 51 35.74	2.4313	N.22 13 8.8	0.877

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 25.					WEDNESDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 51 35.74	2.4313	N.22 13 8.8	0.877	0	6 45 26.20	2.2848	N.20 25 57.4	5.108
1	4 54 1.58	2.4301	22 13 57.3	0.741	1	6 47 43.15	2.2802	20 20 47.7	5.215
2	4 56 27.35	2.4288	22 14 37.7	0.605	2	6 49 59.82	2.2756	20 15 31.6	5.321
3	4 58 53.04	2.4274	22 15 9.9	0.469	3	6 52 16.22	2.2710	20 10 9.2	5.425
4	5 1 18.64	2.4259	22 15 34.0	0.334	4	6 54 32.34	2.2664	20 4 40.6	5.528
5	5 3 44.15	2.4243	22 15 50.0	0.199	5	6 56 48.19	2.2618	19 59 5.8	5.632
6	5 6 9.56	2.4227	22 15 57.9	+ 0.065	6	6 59 3.75	2.2570	19 53 24.8	5.734
7	5 8 34.87	2.4210	22 15 57.8	− 0.069	7	7 1 19.03	2.2523	19 47 37.7	5.835
8	5 11 0.08	2.4192	22 15 49.6	0.204	8	7 3 34.02	2.2475	19 41 44.6	5.934
9	5 13 25.17	2.4173	22 15 33.3	0.338	9	7 5 48.73	2.2428	19 35 45.6	6.033
10	5 15 50.15	2.4153	22 15 9.1	0.471	10	7 8 3.15	2.2380	19 29 40.6	6.132
11	5 18 15.00	2.4132	22 14 36.8	0.605	11	7 10 17.29	2.2332	19 23 29.8	6.228
12	5 20 39.73	2.4110	22 13 56.5	0.738	12	7 12 31.13	2.2283	19 17 13.2	6.324
13	5 23 4.32	2.4088	22 13 8.3	0.869	13	7 14 44.68	2.2234	19 10 50.9	6.419
14	5 25 28.78	2.4064	22 12 12.2	1.001	14	7 16 57.94	2.2186	19 4 22.9	6.513
15	5 27 53.09	2.4040	22 11 8.2	1.132	15	7 19 10.91	2.2137	18 57 49.3	6.607
16	5 30 17.26	2.4015	22 9 56.3	1.263	16	7 21 23.58	2.2088	18 51 10.1	6.699
17	5 32 41.27	2.3989	22 8 36.6	1.393	17	7 23 35.96	2.2039	18 44 25.4	6.789
18	5 35 5.13	2.3962	22 7 9.1	1.523	18	7 25 48.05	2.1990	18 37 35.3	6.879
19	5 37 28.82	2.3934	22 5 33.8	1.653	19	7 27 59.84	2.1940	18 30 39.9	6.968
20	5 39 52.34	2.3907	22 3 50.7	1.783	20	7 30 11.33	2.1891	18 23 39.1	7.057
21	5 42 15.70	2.3878	22 1 59.9	1.911	21	7 32 22.53	2.1842	18 16 33.1	7.143
22	5 44 38.88	2.3848	22 0 1.4	2.039	22	7 34 33.43	2.1792	18 9 21.9	7.229
23	5 47 1.87	2.3817	N.21 57 55.2	2.167	23	7 36 44.03	2.1743	N.18 2 5.6	7.314
	TUESDAY 26.					THURSDAY 28.			
0	5 49 24.68	2.3786	N.21 55 41.4	2.293	0	7 38 54.34	2.1693	N.17 54 44.2	7.398
1	5 51 47.30	2.3753	21 53 20.1	2.418	1	7 41 4.35	2.1643	17 47 17.8	7.481
2	5 54 9.72	2.3721	21 50 51.2	2.544	2	7 43 14.06	2.1593	17 39 46.5	7.563
3	5 56 31.95	2.3688	21 48 14.8	2.669	3	7 45 23.47	2.1544	17 32 10.3	7.643
4	5 58 53.98	2.3654	21 45 30.9	2.793	4	7 47 32.59	2.1495	17 24 29.3	7.723
5	6 1 15.80	2.3618	21 42 39.6	2.916	5	7 49 41.41	2.1445	17 16 43.6	7.802
6	6 3 37.40	2.3583	21 39 41.0	3.038	6	7 51 49.93	2.1396	17 8 53.1	7.880
7	6 5 58.79	2.3548	21 36 35.0	3.160	7	7 53 58.16	2.1348	17 0 58.0	7.956
8	6 8 19.97	2.3511	21 33 21.8	3.281	8	7 56 6.10	2.1298	16 52 58.3	8.032
9	6 10 40.92	2.3473	21 30 1.3	3.402	9	7 58 13.74	2.1248	16 44 54.1	8.108
10	6 13 1.65	2.3436	21 26 33.6	3.522	10	8 0 21.08	2.1199	16 36 45.4	8.181
11	6 15 22.15	2.3397	21 22 58.7	3.640	11	8 2 28.13	2.1151	16 28 32.4	8.253
12	6 17 42.41	2.3358	21 19 16.8	3.758	12	8 4 34.89	2.1103	16 20 15.1	8.324
13	6 20 2.44	2.3318	21 15 27.8	3.875	13	8 6 41.36	2.1053	16 11 53.5	8.395
14	6 22 22.22	2.3277	21 11 31.8	3.992	14	8 8 47.53	2.1005	16 3 27.7	8.465
15	6 24 41.76	2.3237	21 7 28.8	4.108	15	8 10 53.42	2.0958	15 54 57.7	8.533
16	6 27 1.06	2.3196	21 3 18.9	4.222	16	8 12 59.02	2.0909	15 46 23.7	8.601
17	6 29 20.11	2.3153	20 59 2.2	4.336	17	8 15 4.33	2.0862	15 37 45.6	8.668
18	6 31 38.90	2.3111	20 54 38.6	4.449	18	8 17 9.36	2.0814	15 29 3.5	8.734
19	6 33 57.44	2.3068	20 50 8.3	4.561	19	8 19 14.10	2.0767	15 20 17.5	8.798
20	6 36 15.72	2.3025	20 45 31.3	4.672	20	8 21 18.56	2.0719	15 11 27.7	8.862
21	6 38 33.74	2.2981	20 40 47.7	4.782	21	8 23 22.73	2.0673	15 2 34.1	8.925
22	6 40 51.49	2.2937	20 35 57.5	4.892	22	8 25 26.63	2.0627	14 53 36.7	8.987
23	6 43 8.98	2.2893	20 31 0.7	5.001	23	8 27 30.25	2.0580	14 44 35.7	9.047
24	6 45 26.20	2.2848	N.20 25 57.4	5.108	24	8 29 33.59	2.0534	N.14 35 31.1	9.107

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 29.			
	h m s	s	° ′ ″	″
0	8 29 33.59	2.0534	N.14 35 31.1	9.107
1	8 31 36.66	2.0488	14 26 22.9	9.166
2	8 33 39.45	2.0443	14 17 11.2	9.224
3	8 35 41.97	2.0398	14 7 56.0	9.281
4	8 37 44.22	2.0353	13 58 37.5	9.337
5	8 39 46.21	2.0309	13 49 15.6	9.392
6	8 41 47.93	2.0264	13 39 50.5	9.445
7	8 43 49.38	2.0220	13 30 22.2	9.498
8	8 45 50.57	2.0178	13 20 50.7	9.551
9	8 47 51.51	2.0135	13 11 16.1	9.603
10	8 49 52.19	2.0092	13 1 38.4	9.653
11	8 51 52.61	2.0048	12 51 57.7	9.702
12	8 53 52.77	2.0006	12 42 14.2	9.750
13	8 55 52.68	1.9965	12 32 27.7	9.798
14	8 57 52.35	1.9924	12 22 38.4	9.845
15	8 59 51.77	1.9883	12 12 46.3	9.891
16	9 1 50.95	1.9843	12 2 51.5	9.936
17	9 3 49.89	1.9803	11 52 54.0	9.980
18	9 5 48.59	1.9763	11 42 53.9	10.023
19	9 7 47.05	1.9724	11 32 51.2	10.066
20	9 9 45.28	1.9686	11 22 46.0	10.108
21	9 11 43.28	1.9648	11 12 38.3	10.148
22	9 13 41.05	1.9610	11 2 28.2	10.188
23	9 15 38.60	1.9573	N.10 52 15.7	10.227
	SATURDAY 30.			
0	9 17 35.92	1.9535	N.10 42 0.9	10.264
1	9 19 33.02	1.9499	10 31 43.9	10.302
2	9 21 29.91	1.9463	10 21 24.6	10.339
3	9 23 26.58	1.9428	10 11 3.2	10.374
4	9 25 23.04	1.9393	10 0 39.7	10.409
5	9 27 19.29	1.9358	9 50 14.1	10.444
6	9 29 15.34	1.9324	9 39 46.4	10.477
7	9 31 11.18	1.9290	9 29 16.8	10.509
8	9 33 6.82	1.9258	9 18 45.3	10.541
9	9 35 2.27	1.9225	9 8 11.9	10.572
10	9 36 57.52	1.9193	8 57 36.7	10.602
11	9 38 52.59	1.9162	8 46 59.7	10.631
12	9 40 47.46	1.9130	8 36 21.0	10.659
13	9 42 42.15	1.9100	8 25 40.6	10.688
14	9 44 36.66	1.9070	8 14 58.5	10.715
15	9 46 30.99	1.9040	8 4 14.8	10.741
16	9 48 25.14	1.9011	7 53 29.6	10.766
17	9 50 19.12	1.8983	7 42 42.9	10.791
18	9 52 12.93	1.8955	7 31 54.7	10.815
19	9 54 6.58	1.8928	7 21 5.1	10.838
20	9 56 0.06	1.8901	7 10 14.1	10.861
21	9 57 53.39	1.8875	6 59 21.8	10.883
22	9 59 46.56	1.8849	6 48 28.2	10.903
23	10 1 39.58	1.8823	6 37 33.4	10.923
24	10 3 32.44	1.8798	N. 6 26 37.4	10.943

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY, JULY 1.			
	h m s	s	° ′ ″	″
0	10 3 32.44	1.8798	N. 6 26 37.4	10.943

PHASES OF THE MOON.

			d	h	m
☽	First Quarter . . .	June	4	18	58.8
○	Full Moon		12	15	38.5
☾	Last Quarter		19	12	57.4
●	New Moon		26	13	27.4

			d	h
☾	Apogee	June	5	8.8
☾	Perigee		18	14.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Sun	W.	47 39 11	3157	49 6 12	3171	50 32 56	3185	51 59 23	3199
	Spica	E.	84 17 50	2816	82 43 43	2829	81 9 53	2842	79 36 20	2855
	Jupiter	E.	127 20 8	2772	125 45 3	2785	124 10 16	2798	122 35 45	2811
2	Sun	W.	59 7 34	3265	60 32 27	3277	61 57 5	3289	63 21 29	3300
	Pollux	W.	21 44 8	3427	23 5 54	3384	24 28 29	3344	25 51 50	3312
	Venus	W.	21 18 46	3258	22 43 47	3249	24 8 58	3244	25 34 15	3240
	Spica	E.	71 52 39	2916	70 20 41	2927	68 48 57	2938	67 17 27	2949
	Jupiter	E.	114 47 15	2871	113 14 19	2882	111 41 37	2893	110 9 9	2903
3	Sun	W.	70 20 23	3351	71 43 35	3360	73 6 37	3368	74 29 30	3376
	Pollux	W.	32 55 52	3224	34 21 33	3214	35 47 26	3207	37 13 27	3201
	Venus	W.	32 41 23	3237	34 6 48	3239	35 32 11	3241	36 57 32	3242
	Spica	E.	59 43 7	2997	58 12 50	3005	56 42 43	3012	55 12 45	3020
	Jupiter	E.	102 29 57	2950	100 58 41	2958	99 27 35	2965	97 56 38	2973
4	Sun	W.	81 21 50	3408	82 43 57	3414	84 5 58	3418	85 27 54	3422
	Pollux	W.	44 24 55	3183	45 51 24	3181	47 17 55	3179	48 44 29	3178
	Venus	W.	44 3 45	3251	45 28 54	3252	46 54 1	3253	48 19 8	3253
	Spica	E.	47 45 6	3051	46 15 56	3056	44 46 52	3060	43 17 53	3063
	Jupiter	E.	90 24 1	3002	88 53 51	3006	87 23 47	3010	85 53 47	3014
	Saturn	E.	118 22 58	3022	116 53 13	3027	115 23 34	3030	113 53 59	3034
5	Sun	W,	92 16 42	3433	93 38 21	3434	94 59 59	3435	96 21 36	3434
	Pollux	W.	55 57 54	3167	57 24 43	3165	58 51 34	3162	60 18 29	3159
	Venus	W.	55 24 44	3250	56 49 54	3248	58 15 6	3246	59 40 21	3243
	Regulus	W.	19 1 56	3259	20 26 56	3236	21 52 22	3216	23 18 12	3199
	Jupiter	E.	78 24 44	3025	76 55 2	3026	75 25 22	3026	73 55 42	3026
	Saturn	E.	106 27 1	3045	104 57 44	3046	103 28 28	3046	101 59 12	3045
6	Sun	W.	103 10 2	3424	104 31 51	3421	105 53 43	3417	107 15 40	3413
	Pollux	W,	67 34 3	3140	69 1 24	3135	70 28 51	3130	71 56 24	3125
	Venus	W.	66 47 33	3224	68 13 14	3218	69 39. 2	3212	71 4 57	3206
	Regulus	W.	30 31 40	3140	31 59 1	3130	33 26 34	3121	34 54 18	3113
	Jupiter	E.	66 27 4	3018	64 57 13	3014	63 27 18	3011	61 57 19	3008
	Saturn	E.	94 32 34	3037	93 3 7	3034	91 33 36	3030	90 3 59	3026
7	Sun	W.	114 6 50	3384	115 29 25	3377	116 52 8	3369	118 15 0	3361
	Pollux	W.	79 15 53	3094	80 44 10	3087	82 12 36	3079	83 41 11	3070
	Venus	W.	78 16 30	3169	79 43 16	3160	81 10 13	3151	82 37 21	3142
	Regulus	W.	42 15 37	3069	43 44 25	3060	45 13 24	3051	46 42 34	3041
	Jupiter	E.	54 26 2	2981	52 55 26	2975	51 24 42	2968	49 53 49	2961
	Saturn	E.	82 34 35	3000	81 4 22	2993	79 34 0	2985	78 3 29	2978
	a Aquilæ	E.	109 36 35	3516	108 16 29	3502	106 56 7	3487	105 35 28	3473
8	Sun	W.	125 11 46	3315	126 35 40	3305	127 59 46	3294	129 24 4	3283
	Pollux	W.	91 6 40	3028	92 36 18	3019	94 6 7	3009	95 36 9	2999
	Venus	W.	89 55 54	3091	91 24 15	3078	92 52 51	3067	94 21 41	3055
	Regulus	W.	54 11 26	2992	55 41 49	2981	57 12 26	2970	58 43 16	2958
	Jupiter	E.	42 17 2	2920	40 45 8	2911	39 13 3	2901	37 40 46	2891
	Saturn	E.	70 28 26	2936	68 56 53	2926	67 25 7	2916	65 53 9	2907
	a Aquilæ	E.	98 48 22	3406	97 26 12	3393	96 3 47	3380	94 41 8	3369

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Sun	W.	53 25 33	3214	54 51 26	3226	56 17 4	3239	57 42 27	3253
	Spica	E.	78 3 4	2869	76 30 5	2880	74 57 21	2892	73 24 52	2905
	Jupiter	E.	121 1 31	2824	119 27 34	2835	117 53 52	2847	116 20 26	2859
2	Sun	W.	64 45 40	3311	66 9 39	3322	67 33 25	3332	68 57 0	3342
	Pollux	W.	27 15 48	3285	28 40 17	3263	30 5 12	3247	31 30 25	3235
	Venus	W.	26 59 37	3236	28 25 3	3236	29 50 30	3236	31 15 56	3236
	Spica	E.	65 46 10	2959	64 15 6	2969	62 44 15	2978	61 13 35	2988
	Jupiter	E.	108 36 54	2913	107 4 52	2923	105 33 2	2932	104 1 24	2941
3	Sun	W.	75 52 14	3384	77 14 49	3390	78 37 17	3397	79 59 37	3403
	Pollux	W.	38 39 35	3196	40 5 49	3193	41 32 7	3189	42 58 29	3186
	Venus	W.	38 22 51	3244	39 48 8	3246	41 13 22	3248	42 38 34	3249
	Spica	E.	53 42 57	3027	52 13 18	3033	50 43 47	3039	49 14 23	3045
	Jupiter	E.	96 25 51	2980	94 55 13	2985	93 24 42	2991	91 54 18	2997
4	Sun	W.	86 49 46	3425	88 11 34	3428	89 33 19	3430	90 55 1	3431
	Pollux	W.	50 11 5	3175	51 37 44	3173	53 4 25	3171	54 31 8	3169
	Venus	W.	49 44 15	3253	51 9 21	3253	52 34 28	3253	53 59 35	3252
	Spica	E.	41 48 58	3067	40 20 8	3069	38 51 21	3072	37 22 38	3074
	Jupiter	E.	84 23 52	3018	82 54 1	3020	81 24 13	3022	79 54 27	3024
	Saturn	E.	112 24 29	3038	110 55 3	3040	109 25 40	3042	107 56 20	3044
5	Sun	W.	97 43 14	3433	99 4 53	3432	100 26 33	3430	101 48 16	3427
	Pollux	W.	61 45 27	3156	63 12 29	3152	64 39 36	3148	66 6 47	3144
	Venus	W.	61 5 39	3240	62 31 0	3236	63 56 26	3232	65 21 57	3228
	Regulus	W.	24 44 22	3185	26 10 50	3172	27 37 34	3160	29 4 31	3150
	Jupiter	E.	72 26 1	3026	70 56 20	3024	69 26 37	3022	67 56 52	3020
	Saturn	E.	100 29 55	3045	99 0 38	3043	97 31 19	3041	96 1 58	3039
6	Sun	W.	108 37 42	3408	109 59 49	3403	111 22 2	3397	112 44 22	3390
	Pollux	W.	73 24 3	3119	74 51 49	3113	76 19 43	3107	77 47 44	3101
	Venus	W.	72 30 59	3199	73 57 9	3193	75 23 27	3185	76 49 54	3178
	Regulus	W.	36 22 12	3104	37 50 17	3095	39 18 33	3086	40 47 0	3078
	Jupiter	E.	60 27 16	3003	58 57 7	2998	57 26 52	2993	55 56 30	2988
	Saturn	E.	88 34 18	3022	87 4 32	3017	85 34 40	3011	84 4 41	3005
7	Sun	W.	119 38 1	3352	121 1 12	3344	122 24 33	3335	123 48 4	3325
	Pollux	W.	85 9 57	3063	86 38 52	3055	88 7 57	3046	89 37 13	3037
	Venus	W.	84 4 39	3133	85 32 9	3123	86 59 51	3112	88 27 46	3101
	Regulus	W.	48 11 56	3031	49 41 30	3021	51 11 16	3011	52 41 15	3001
	Jupiter	E.	48 22 47	2954	46 51 36	2946	45 20 15	2938	43 48 44	2929
	Saturn	E.	76 32 49	2970	75 1 59	2962	73 30 59	2954	71 59 48	2945
	a Aquilæ	E.	104 14 34	3459	102 53 24	3446	101 31 59	3432	100 10 18	3418
8	Sun	W.	130 48 35	3272	132 13 19	3260	133 38 17	3249	135 3 28	3236
	Pollux	W.	97 6 23	2989	98 36 49	2980	100 7 27	2969	101 38 18	2958
	Venus	W.	95 50 46	3043	97 20 6	3031	98 49 40	3018	100 19 30	3005
	Regulus	W.	60 14 21	2947	61 45 40	2936	63 17 13	2924	64 49 1	2912
	Jupiter	E.	36 8 16	2882	34 35 34	2872	33 2 39	2862	31 29 31	2851
	Saturn	E.	64 20 59	2896	62 48 35	2886	61 15 58	2875	59 43 7	2864
	a Aquilæ	E.	93 18 16	3357	91 55 10	3346	90 31 52	3335	89 8 20	3324

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
9	Pollux	W.	103 9 23	2948	104 40 41	2938	106 12 12	2927	107 43 57	2916
	Venus	W.	101 49 37	2992	103 20 0	2978	104 50 40	2965	106 21 37	2952
	Regulus	W.	66 21 4	2901	67 53 22	2888	69 25 56	2876	70 58 46	2864
	Jupiter	E.	29 56 9	2840	28 22 33	2829	26 48 43	2818	25 14 39	2808
	Saturn	E.	58 10 2	2852	56 36 42	2841	55 3 7	2829	53 29 17	2818
	α Aquilæ	E.	87 44 36	3313	86 20 40	3303	84 56 32	3294	83 32 13	3284
	Fomalhaut	E.	114 26 25	3458	113 5 14	3433	111 43 35	3409	110 21 29	3386
10	Venus	W.	114 0 40	2882	115 33 22	2867	117 6 23	2853	118 39 42	2840
	Regulus	W.	78 46 55	2800	80 21 23	2788	81 56 7	2775	83 31 8	2761
	Spica	W.	24 43 39	2792	26 18 18	2778	27 53 15	2764	29 28 31	2750
	Saturn	E.	45 36 12	2756	44 0 46	2743	42 25 3	2730	40 49 3	2718
	α Aquilæ	E.	76 28 7	3246	75 2 52	3241	73 37 31	3236	72 12 4	3231
	Fomalhaut	E.	103 24 38	3282	102 0 5	3264	100 35 11	3246	99 9 56	3228
	α Pegasi	E.	123 28 44	2973	121 57 57	2953	120 26 45	2934	118 55 9	2916
11	Regulus	W.	91 30 33	2696	93 7 18	2684	94 44 19	2671	96 21 38	2659
	Spica	W.	37 29 21	2682	39 6 25	2669	40 43 46	2656	42 21 26	2643
	Saturn	E.	32 44 53	2654	31 7 11	2641	29 29 12	2629	27 50 56	2617
	α Aquilæ	E.	65 3 56	3226	63 38 18	3230	62 12 44	3234	60 47 15	3239
	Fomalhaut	E.	91 58 48	3152	90 31 41	3139	89 4 19	3127	87 36 42	3114
	α Pegasi	E.	111 11 32	2831	109 37 44	2815	108 3 35	2799	106 29 6	2784
12	Spica	W.	50 34 7	2579	52 13 31	2567	53 53 11	2555	55 33 8	2543
	α Aquilæ	E.	53 42 26	3305	52 18 20	3326	50 54 39	3351	49 31 27	3380
	Fomalhaut	E.	80 15 22	3069	78 46 35	3063	77 17 40	3058	75 48 39	3053
	α Pegasi	E.	98 31 49	2713	96 55 27	2700	95 18 48	2687	93 41 51	2675
13	Spica	W.	63 56 54	2487	65 38 26	2477	67 20 12	2466	69 2 13	2456
	Jupiter	W.	22 23 16	2457	24 5 30	2445	25 48 1	2434	27 30 47	2424
	Fomalhaut	E.	68 22 45	3052	66 53 36	3056	65 24 33	3061	63 55 36	3069
	α Pegasi	E.	85 33 12	2621	83 54 45	2612	82 16 6	2602	80 37 14	2593
	α Arietis	E.	128 54 0	2536	127 13 37	2523	125 32 56	2511	123 51 58	2499
14	Spica	W.	77 35 42	2410	79 19 2	2402	81 2 35	2394	82 46 19	2386
	Jupiter	W.	36 8 14	2376	37 52 23	2367	39 36 45	2359	41 21 18	2351
	Fomalhaut	E.	56 34 9	3143	55 6 52	3166	53 40 2	3193	52 13 44	3225
	α Pegasi	E.	72 20 10	2559	70 40 18	2554	69 0 20	2549	67 20 15	2545
	α Arietis	E.	115 23 10	2446	113 40 41	2437	111 57 59	2428	110 15 4	2419
15	Jupiter	W.	50 6 48	2317	51 52 23	2311	53 38 7	2305	55 23 59	2299
	Saturn	W.	21 34 53	2331	23 20 7	2324	25 5 32	2317	26 51 6	2312
	Fomalhaut	E.	45 13 16	3457	43 52 4	3525	42 32 8	3601	41 13 35	3689
	α Pegasi	E.	58 58 56	2539	57 18 37	2541	55 38 21	2544	53 58 8	2548
	α Arietis	E.	101 37 38	2382	99 53 37	2376	98 9 27	2370	96 25 9	2364
	Mars	E.	117 38 38	2583	115 59 20	2577	114 19 53	2570	112 40 17	2564
16	Jupiter	W.	64 15 11	2277	66 1 45	2272	67 48 25	2269	69 35 10	2266
	Saturn	W.	35 40 50	2288	37 27 7	2285	39 13 29	2281	40 59 57	2277
	α Pegasi	E.	45 39 8	2591	44 0 1	2606	42 21 14	2624	40 42 51	2643
	α Arietis	E.	87 41 45	2341	85 56 45	2337	84 11 40	2334	82 26 30	2331
	Mars	E.	104 20 24	2539	102 40 5	2535	100 59 41	2531	99 19 11	2528

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
9	Pollux	W.	109 15 55	2906	110 48 6	2895	112 20 31	2884	113 53 10	2873
	VENUS	W.	107 52 50	2938	109 24 21	2924	110 56 9	2910	112 28 15	2895
	Regulus	W.	72 31 51	2852	74 5 12	2839	75 38 50	2826	77 12 44	2815
	JUPITER	E.	23 40 21	2796	22 5 48	2786	20 31 2	2776	18 56 2	2766
	SATURN	E.	51 55 12	2805	50 20 51	2793	48 46 14	2781	47 11 21	2769
	α Aquilæ	E.	82 7 43	3276	80 43 3	3267	79 18 13	3259	77 53 14	3253
	Fomalhaut	E.	108 58 56	3364	107 35 58	3342	106 12 35	3321	104 48 48	3301
10	VENUS	W.	120 13 19	2825	121 47 14	2811	123 21 28	2797	124 56 0	2783
	Regulus	W.	85 6 27	2748	86 42 3	2736	88 17 55	2722	89 54 5	2709
	Spica	W.	31 4 5	2736	32 39 57	2722	34 16 7	2709	35 52 35	2695
	SATURN	E.	39 12 47	2706	37 36 14	2692	35 59 24	2680	34 22 17	2667
	α Aquilæ	E.	70 46 31	3228	69 20 55	3226	67 55 16	3225	66 29 36	3225
	Fomalhaut	E.	97 44 20	3212	96 18 25	3196	94 52 11	3180	93 25 38	3166
	α Pegasi	E.	117 23 10	2898	115 50 49	2880	114 18 5	2863	112 44 59	2847
11	Regulus	W.	97 59 13	2646	99 37 6	2634	101 15 14	2622	102 53 39	2608
	Spica	W.	43 59 23	2629	45 37 38	2617	47 16 10	2604	48 55 0	2591
	SATURN	E.	26 12 24	2604	24 33 35	2592	22 54 29	2581	21 15 8	2569
	α Aquilæ	E.	59 21 52	3247	57 56 39	3259	56 31 39	3272	55 6 53	3287
	Fomalhaut	E.	86 8 50	3104	84 40 45	3095	83 12 29	3085	81 44 1	3076
	α Pegasi	E.	104 54 17	2769	103 19 8	2755	101 43 41	2740	100 7 54	2726
12	Spica	W.	57 13 21	2532	58 53 50	2520	60 34 36	2509	62 15 37	2497
	α Aquilæ	E.	48 8 48	3415	46 46 48	3454	45 25 33	3499	44 5 8	3551
	Fomalhaut	E.	74 19 32	3051	72 50 22	3049	71 21 10	3048	69 51 57	3049
	α Pegasi	E.	92 4 38	2663	90 27 9	2652	88 49 25	2641	87 11 26	2630
13	Spica	W.	70 44 25	2446	72 26 57	2437	74 9 39	2428	75 52 34	2419
	JUPITER	W.	29 13 48	2413	30 57 4	2403	32 40 34	2394	34 24 18	2385
	Fomalhaut	E.	62 26 49	3079	60 58 14	3091	59 29 54	3105	58 1 51	3123
	α Pegasi	E.	78 58 9	2585	77 18 54	2578	75 39 29	2571	73 59 54	2564
	α Arietis	E.	122 10 43	2487	120 29 12	2477	118 47 26	2466	117 5 25	2456
14	Spica	W.	84 30 14	2378	86 14 20	2371	87 58 36	2364	89 43 2	2357
	JUPITER	W.	43 6 3	2344	44 50 59	2337	46 36 5	2330	48 21 22	2323
	Fomalhaut	E.	50 48 4	3259	49 23 5	3300	47 58 54	3345	46 35 35	3398
	α Pegasi	E.	65 40 5	2543	63 59 51	2541	62 19 34	2539	60 39 15	2539
	α Arietis	E.	108 31 57	2411	106 48 38	2403	105 5 8	2396	103 21 28	2389
15	JUPITER	W.	57 10 0	2294	58 56 8	2290	60 42 22	2285	61 28 43	2281
	SATURN	W.	28 36 48	2307	30 22 38	2302	32 8 35	2297	33 54 39	2292
	Fomalhaut	E.	39 56 36	3789	38 41 22	3903	37 28 5	4033	36 16 58	4184
	α Pegasi	E.	52 18 1	2553	50 38 1	2560	48 58 11	2568	47 18 32	2579
	α Arietis	E.	94 40 42	2359	92 56 8	2354	91 11 27	2349	89 26 39	2345
	MARS	E.	111 0 33	2559	109 20 42	2553	107 40 43	2548	106 0 37	2543
16	JUPITER	W.	71 21 59	2263	73 8 53	2261	74 55 50	2258	76 42 51	2256
	SATURN	W.	42 46 30	2274	44 33 7	2271	46 19 49	2269	48 6 34	2266
	α Pegasi	E.	39 4 55	2669	37 27 33	2698	35 50 51	2731	34 14 52	2768
	α Arietis	E.	80 41 16	2328	78 55 58	2326	77 10 36	2324	75 25 12	2322
	MARS	E.	97 38 37	2525	95 57 58	2522	94 17 15	2519	92 36 28	2516

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h}.	P. L. of Diff.	VI^{h}.	P. L. of Diff.	IX^{h}.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
17	JUPITER	W.	78 29 56	2254	80 17 3	2252	82 4 13	2251	83 51 25	2249
	SATURN	W.	49 53 23	2264	51 40 15	2263	53 27 9	2261	55 14 6	2260
	a Aquilæ	W.	31 47 20	4486	32 51 24	4275	33 58 40	4092	35 8 49	3934
	a Arietis	E.	73 39 45	2321	71 54 16	2320	70 8 45	2319	68 23 13	2318
	MARS	E.	90 55 37	2514	89 14 43	2512	87 33 47	2510	85 52 48	2509
	SUN	E.	123 38 14	2589	121 59 4	2587	120 19 50	2585	118 40 34	2583
18	JUPITER	W.	92 47 50	2246	94 35 9	2245	96 22 29	2246	98 9 48	2245
	SATURN	W.	64 9 17	2256	65 56 22	2256	67 43 27	2255	69 30 33	2255
	a Aquilæ	W.	41 33 35	3397	42 55 55	3324	44 19 39	3258	45 44 40	3200
	a Arietis	E.	59 35 33	2321	57 50 4	2322	56 4 37	2324	54 19 13	2327
	MARS	E.	77 27 27	2504	75 46 20	2504	74 5 12	2504	72 24 4	2504
	SUN	E.	110 23 49	2579	108 44 25	2579	107 5 1	2579	105 25 37	2579
19	JUPITER	W.	107 6 22	2249	108 53 36	2251	110 40 48	2253	112 27 57	2254
	SATURN	W.	78 25 56	2258	80 12 57	2259	81 59 57	2260	83 46 55	2261
	a Aquilæ	W.	53 4 46	2990	54 35 11	2962	56 6 12	2935	57 37 47	2910
	MARS	E.	63 58 31	2507	62 17 27	2508	60 36 25	2509	58 55 24	2510
	SUN	E.	97 8 44	2582	95 29 24	2583	93 50 6	2585	92 10 50	2586
20	SATURN	W.	92 41 14	2270	94 27 58	2272	96 14 39	2274	98 1 17	2277
	a Aquilæ	W.	65 22 21	2825	66 56 17	2813	68 30 28	2803	70 4 53	2794
	MARS	E.	50 30 54	2522	48 50 8	2525	47 9 25	2527	45 28 46	2530
	SUN	E.	83 55 3	2596	82 16 2	2598	80 37 4	2600	78 58 9	2602
21	*a* Aquilæ	W.	77 59 17	2768	79 34 27	2766	81 9 40	2765	82 44 54	2765
	a Pegasi	W.	30 17 6	2872	31 50 1	2824	33 24 0	2783	34 58 50	2747
	MARS	E.	37 6 28	2543	35 26 14	2546	33 46 5	2550	32 6 1	2554
	SUN	E.	70 44 32	2618	69 6 1	2622	67 27 35	2626	65 49 15	2629
22	*a* Aquilæ	W.	90 40 40	2779	92 15 36	2785	93 50 25	2791	95 25 5	2798
	Fomalhaut	W.	64 1 5	2939	65 32 38	2926	67 4 24	2916	68 36 23	2908
	a Pegasi	W.	43 2 47	2635	44 40 54	2621	46 19 20	2610	47 58 1	2601
	SUN	E.	57 38 55	2651	56 1 9	2656	54 23 30	2661	52 45 58	2666
23	Fomalhaut	W.	76 18 21	2886	77 50 58	2885	79 23 36	2885	80 56 14	2887
	a Pegasi	W.	56 13 48	2578	57 53 13	2576	59 32 41	2575	61 12 10	2576
	SUN	E.	44 40 10	2696	43 3 25	2704	41 26 50	2710	39 50 24	2717
24	Fomalhaut	W.	88 38 28	2910	90 10 34	2918	91 42 31	2926	93 14 17	2935
	a Pegasi	W.	69 29 3	2589	71 8 13	2593	72 47 17	2598	74 26 15	2604
	SUN	E.	31 50 42	2758	30 15 19	2767	28 40 8	2777	27 5 10	2787
28	SUN	W.	17 33 29	3127	19 1 6	3135	20 28 33	3144	21 55 49	3154
	Spica	E.	88 50 1	2761	87 14 42	2772	85 39 38	2784	84 4 49	2795
29	SUN	W.	29 9 3	3207	30 35 4	3219	32 0 51	3230	33 26 25	3241
	Spica	E.	76 14 29	2852	74 41 9	2864	73 8 4	2875	71 35 13	2885
30	SUN	W.	40 31 5	3294	41 55 24	3303	43 19 32	3313	44 43 28	3322
	Spica	E.	63 54 16	2936	62 22 43	2946	60 51 23	2956	59 20 14	2965
	JUPITER	E.	103 46 10	2906	102 13 59	2916	100 42 1	2925	99 10 14	2934

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
17	JUPITER	W.	85 38 39	2248	87 25 55	2247	89 13 12	2246	91 0 31	2246
	SATURN	W.	57 1 5	2258	58 48 6	2257	60 35 8	2256	62 22 12	2256
	α Aquilæ	W.	36 21 34	3800	37 36 36	3679	38 53 45	3574	40 12 48	3480
	α Arietis	E.	66 37 41	2318	64 52 8	2319	63 6 36	2319	61 21 4	2320
	MARS	E.	84 11 47	2507	82 30 44	2506	80 49 40	2505	79 8 34	2504
	SUN	E.	117 1 15	2582	115 21 55	2581	113 42 34	2580	112 3 12	2580
18	JUPITER	W.	99 57 8	2246	101 44 27	2246	103 31 47	2246	105 19 5	2246
	SATURN	W.	71 17 39	2256	73 4 44	2256	74 51 49	2256	76 38 53	2257
	α Aquilæ	W.	47 10 49	3150	48 37 58	3105	50 6 2	3060	51 35 0	3022
	α Arietis	E.	52 33 53	2329	50 48 36	2332	49 3 24	2336	47 18 17	2340
	MARS	E.	70 42 56	2504	69 1 49	2504	67 20 42	2505	65 39 36	2506
	SUN	E.	103 46 13	2579	102 6 49	2580	100 27 26	2580	98 48 4	2581
19	JUPITER	W.	114 15 5	2255	116 2 11	2256	117 49 15	2258	119 36 16	2259
	SATURN	W.	85 33 52	2263	87 20 46	2264	89 7 38	2266	90 54 27	2268
	α Aquilæ	W.	59 9 53	2889	60 42 26	2870	62 15 23	2853	63 48 42	2838
	MARS	E.	57 14 25	2512	55 33 29	2514	53 52 35	2516	52 11 43	2518
	SUN	E.	90 31 36	2588	88 52 24	2589	87 13 14	2591	85 34 7	2593
20	SATURN	W.	99 47 51	2279	101 34 21	2282	103 20 47	2284	105 7 10	2287
	α Aquilæ	W.	71 39 29	2786	73 14 15	2780	74 49 9	2775	76 24 10	2770
	MARS	E.	43 48 10	2530	42 7 39	2533	40 27 11	2536	38 46 47	2539
	SUN	E.	77 19 17	2605	75 40 29	2609	74 1 46	2612	72 23 7	2615
21	α Aquilæ	W.	84 20 8	2766	85 55 21	2768	87 30 32	2771	89 5 38	2774
	α Pegasi	W.	36 34 27	2716	38 10 45	2689	39 47 39	2669	41 25 0	2650
	MARS	E.	30 26 3	2559	28 46 11	2563	27 6 25	2568	25 26 46	2573
	SUN	E.	64 11 0	2634	62 32 51	2638	60 54 47	2642	59 16 48	2646
22	α Aquilæ	W.	96 59 36	2806	98 33 56	2816	100 8 3	2826	101 41 57	2836
	Fomalhaut	W.	70 8 32	2901	71 40 50	2895	73 13 15	2891	74 45 46	2887
	α Pegasi	W.	49 36 54	2594	51 15 57	2588	52 55 8	2583	54 34 26	2580
	SUN	E.	51 8 33	2672	49 31 16	2678	47 54 6	2684	46 17 4	2689
23	Fomalhaut	W.	82 28 50	2889	84 1 23	2893	85 33 51	2898	87 6 13	2903
	α Pegasi	W.	62 51 38	2577	64 31 4	2580	66 10 27	2582	67 49 47	2585
	SUN	E.	38 14 7	2725	36 38 0	2732	35 2 3	2741	33 26 17	2749
24	Fomalhaut	W.	94 45 51	2946	96 17 12	2958	97 48 18	2970	99 19 9	2983
	α Pegasi	W.	76 5 5	2610	77 43 47	2615	79 22 21	2622	81 0 46	2630
	SUN	E.	25 30 25	2797	23 55 53	2809	22 21 36	2821	20 47 36	2834
28	SUN	W.	23 22 53	3165	24 49 44	3175	26 16 23	3186	27 42 49	3196
	Spica	E.	82 30 15	2807	80 55 56	2819	79 21 53	2830	77 48 4	2841
29	SUN	W.	34 51 46	3252	36 16 54	3262	37 41 50	3272	39 6 33	3282
	Spica	E.	70 2 35	2896	68 30 11	2906	66 58 0	2916	65 26 2	2926
30	SUN	W.	46 7 14	3332	47 30 49	3341	48 54 13	3350	50 17 27	3358
	Spica	E.	57 49 17	2973	56 18 31	2981	54 47 55	2990	53 17 30	2999
	JUPITER	E.	97 38 38	2942	96 7 13	2951	94 36 0	2959	93 4 56	2968

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	6 39 51.70	10.344	N.23 8 4.9	− 9.85	15 44.98	68.71	3 31.18	0.488
Mon.	2	6 43 59.86	10.333	23 3 56.3	10.86	15 44.98	68.67	3 42.76	0.476
Tues.	3	6 48 7.73	10.321	22 59 23.6	11.86	15 44.98	68.63	3 54.05	0.464
Wed.	4	6 52 15.30	10.307	22 54 26.9	−12.86	15 44.98	68.59	4 5.02	0.451
Thur.	5	6 56 22.53	10.293	22 49 6.2	13.85	15 44.98	68.54	4 15.67	0.437
Frid.	6	7 0 29.42	10.278	22 43 21.9	14.84	15 44.99	68.50	4 25.97	0.422
Sat.	7	7 4 35.94	10.262	22 37 13.9	−15.82	15 45.01	68.45	4 35.90	0.406
SUN.	8	7 8 42.06	10.246	22 30 42.5	16.79	15 45.03	68.40	4 45.45	0.389
Mon.	9	7 12 47.78	10.229	22 23 47.6	17.76	15 45.05	68.34	4 54.59	0.372
Tues.	10	7 16 53.08	10.211	22 16 29.6	−18.72	15 45.07	68.28	5 3.31	0.355
Wed.	11	7 20 57.95	10.193	22 8 48.8	19.67	15 45.10	68.22	5 11.60	0.337
Thur.	12	7 25 2.38	10.174	22 0 45.0	20.62	15 45.14	68.16	5 19.45	0.318
Frid.	13	7 29 6.35	10.155	21 52 18.5	−21.56	15 45.18	68.09	5 26.85	0.299
Sat.	14	7 33 9.86	10.135	21 43 29.6	22.49	15 45.23	68.03	5 33.78	0.280
SUN.	15	7 37 12.90	10.115	21 34 18.4	23.42	15 45.28	67.96	5 40.24	0.260
Mon.	16	7 41 15.43	10.095	21 24 45.1	−24.34	15 45.34	67.89	5 46.20	0.239
Tues.	17	7 45 17.49	10.075	21 14 49.8	25.25	15 45.40	67.82	5 51.69	0.218
Wed.	18	7 49 19.04	10.054	21 4 32.9	26.15	15 45.46	67.75	5 56.67	0.197
Thur.	19	7 53 20.08	10.032	20 53 54.5	−27.04	15 45.53	67.67	6 1.14	0.175
Frid.	20	7 57 20.59	10.010	20 42 54.9	27.92	15 45.60	67.59	6 5.09	0.153
Sat.	21	8 1 20.58	9.988	20 31 34.3	28.79	15 45.68	67.51	6 8.50	0.131
SUN.	22	8 5 20.02	9.965	20 19 52.7	−29.64	15 45.76	67.43	6 11.38	0.108
Mon.	23	8 9 18.89	9.942	20 7 50.8	30.49	15 45.84	67.35	6 13.69	0.085
Tues.	24	8 13 17.22	9.918	19 55 28.7	31.33	15 45.93	67.27	6 15.45	0.061
Wed.	25	8 17 14.95	9.894	19 42 46.6	−32.16	15 46.02	67.18	6 16.62	0.037
Thur.	26	8 21 12.10	9.870	19 29 44.9	32.97	15 46.12	67.10	6 17.21	0.013
Frid.	27	8 25 8.65	9.845	19 16 23.7	33.77	15 46.22	67.01	6 17.22	0.012
Sat.	28	8 29 4.61	9.819	19 2 43.4	−34.57	15 46.33	66.93	6 16.62	0.037
SUN.	29	8 32 59.95	9.794	18 48 44.4	35.35	15 46.44	66.84	6 15.41	0.063
Mon.	30	8 36 54.68	9.768	18 34 26.8	36.11	15 46.55	66.75	6 13.59	0.088
Tues.	31	8 40 48.79	9.742	18 19 51.0	36.86	15 46.67	66.66	6 11.16	0.114
Wed.	32	8 44 42.29	9.716	N.18 4 57.3	−37.61	15 46.79	66.57	6 8.11	0.140

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.19$ from the sidereal time.

The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	6 39 51.09	10.344	N.23 8 5.5	− 9.85	3 31.15	0.488	6 36 19.93
Mon.	2	6 43 59.22	10.333	23 3 57.0	10.86	3 42.73	0.476	6 40 16.49
Tues.	3	6 48 7.06	10.321	22 59 24.4	11.86	3 54.02	0.464	6 44 13.05
Wed.	4	6 52 14.60	10.307	22 54 27.8	−12.86	4 4.99	0.451	6 48 9.60
Thur.	5	6 56 21.80	10.293	22 49 7.2	13.85	4 15.64	0.437	6 52 6.16
Frid.	6	7 0 28.66	10.278	22 43 23.0	14.84	4 25.94	0.422	6 56 2.72
Sat.	7	7 4 35.15	10.262	22 37 15.1	−15.82	4 35.87	0.406	6 59 59.27
SUN.	8	7 8 41.25	10.246	22 30 43.8	16.79	4 45.42	0.389	7 3 55.83
Mon.	9	7 12 46.95	10.229	22 23 49.1	17.76	4 54.56	0.372	7 7 52.39
Tues.	10	7 16 52.22	10.211	22 16 31.2	−18.72	5 3.28	0.355	7 11 48.95
Wed.	11	7 20 57.07	10.193	22 8 50.5	19.67	5 11.57	0.337	7 15 45.50
Thur.	12	7 25 1.48	10.174	22 0 46.8	20.62	5 19.42	0.318	7 19 42.06
Frid.	13	7 29 5.43	10.155	21 52 20.5	−21.56	5 26.82	0.299	7 23 38.62
Sat.	14	7 33 8.92	10.135	21 43 31.7	22.49	5 33.75	0.280	7 27 35.17
SUN.	15	7 37 11.94	10.115	21 34 20.6	23.42	5 40.21	0.260	7 31 31.73
Mon.	16	7 41 14.46	10.095	21 24 47.4	−24.34	5 46.18	0.239	7 35 28.29
Tues.	17	7 45 16.51	10.075	21 14 52.3	25.25	5 51.67	0.218	7 39 24.84
Wed.	18	7 49 18.05	10.054	21 4 35.5	26.15	5 56.65	0.197	7 43 21.40
Thur.	19	7 53 19.08	10.032	20 53 57.2	−27.04	6 1.12	0.175	7 47 17.96
Frid.	20	7 57 19.58	10.010	20 42 57.7	27.92	6 5.07	0.153	7 51 14.51
Sat.	21	8 1 19.56	9.988	20 31 37.2	28.79	6 8.49	0.131	7 55 11.07
SUN.	22	8 5 18.99	9.965	20 19 55.8	−29.64	6 11.37	0.108	7 59 7.62
Mon.	23	8 9 17.86	9.942	20 7 54.0	30.49	6 13.68	0.085	8 3 4.18
Tues.	24	8 13 16.18	9.918	19 55 32.0	31.33	6 15.44	0.061	8 7 0.74
Wed.	25	8 17 13.91	9.894	19 42 50.0	−32.16	6 16.62	0.037	8 10 57.29
Thur.	26	8 21 11.06	9.870	19 29 48.4	32.97	6 17.21	0.013	8 14 53.85
Frid.	27	8 25 7.62	9.845	19 16 27.3	33.77	6 17.22	0.012	8 18 50.40
Sat.	28	8 29 3.58	9.819	19 2 47.1	−34.57	6 16.62	0.037	8 22 46.96
SUN.	29	8 32 58.93	9.794	18 48 48.1	35.35	6 15.42	0.063	8 26 43.52
Mon.	30	8 36 53.67	9.768	18 34 30.6	36.11	6 13.60	0.088	8 30 40.07
Tues.	31	8 40 47.79	9.742	18 19 54.8	36.86	6 11.17	0.114	8 34 36.63
Wed.	32	8 44 41.30	9.716	N.18 5 1.1	−37.61	6 8.12	0.140	8 38 33.18

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,
$+9^s.8565$.
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	182	99 9 36.3	8 54.6	143.03	− 0.53	0.0072302	+ 1.1	17 20 49.09
2	183	100 6 48.8	6 7.0	143.02	0.56	0.0072316	+ 0.1	17 16 53.18
3	184	101 4 1.0	3 19.0	143.01	0.55	0.0072306	− 0.9	17 12 57.27
4	185	102 1 13.0	0 30.8	143.00	− 0.50	0.0072274	− 1.8	17 9 1.35
5	186	102 58 24.8	57 42.4	142.99	0.44	0.0072221	2.6	17 5 5.44
6	187	103 55 36.3	54 53.8	142.98	0.35	0.0072148	3.4	17 1 9.53
7	188	104 52 47.7	52 5.0	142.97	− 0.25	0.0072056	− 4.2	16 57 13.62
8	189	105 49 59.0	49 16.1	142.97	− 0.13	0.0071946	4.9	16 53 17.71
9	190	106 47 10.2	46 27.2	142.97	0.00	0.0071819	5.6	16 49 21.80
10	191	107 44 21.4	43 38.2	142.97	+ 0.13	0.0071676	− 6.3	16 45 25.89
11	192	108 41 32.6	40 49.3	142.98	0.25	0.0071518	6.9	16 41 29.98
12	193	109 38 44.1	38 0.6	142.99	0.36	0.0071346	7.4	16 37 34.06
13	194	110 35 55.9	35 12.2	143.00	+ 0.46	0.0071160	− 8.0	16 33 38.15
14	195	111 33 8.0	32 24.2	143.02	0.52	0.0070961	8.6	16 29 42.24
15	196	112 30 20.6	29 36.6	143.04	0.54	0.0070747	9.2	16 25 46.33
16	197	113 27 33.8	26 49.6	143.06	+ 0.54	0.0070518	− 9.9	16 21 50.42
17	198	114 24 47.6	24 3.4	143.09	0.51	0.0070272	10.6	16 17 54.51
18	199	115 22 2.2	21 17.8	143.12	0.44	0.0070009	11.4	16 13 58.60
19	200	116 19 17.6	18 33.0	143.15	+ 0.35	0.0069727	−12.2	16 10 2.69
20	201	117 16 33.8	15 49.2	143.19	0.23	0.0069425	13.1	16 6 6.78
21	202	118 13 50.8	13 5.9	143.23	+ 0.10	0.0069102	14.0	16 2 10.87
22	203	119 11 8.7	10 23.6	143.27	− 0.04	0.0068755	−14.9	15 58 14.96
23	204	120 8 27.3	7 42.1	143.30	0.17	0.0068385	15.9	15 54 19.05
24	205	121 5 46.8	5 1.4	143.33	0.31	0.0067991	16.9	15 50 23.14
25	206	122 3 7.1	2 21.5	143.36	− 0.42	0.0067572	−17.9	15 46 27.23
26	207	122 60 28.1	59 42.4	143.39	0.52	0.0067127	18.9	15 42 31.32
27	208	123 57 49.8	57 4.0	143.42	0.59	0.0066658	20.0	15 38 35.41
28	209	124 55 12.2	54 26.3	143.45	− 0.64	0.0066165	−21.0	15 34 39.50
29	210	125 52 35.4	51 49.2	143.48	0.66	0.0065647	22.0	15 30 43.59
30	211	126 49 59.1	49 12.9	143.51	0.65	0.0065107	23.0	15 26 47.68
31	212	127 47 23.6	46 37.2	143.54	0.62	0.0064543	23.9	15 22 51.77
32	213	128 44 48.7	44 2.2	143.56	− 0.55	0.0063959	−24.8	15 18 55.86
NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^d.0$.								Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 54.0	14 51.7	54 34.4	−0.81	54 25.7	−0.63	3 33.3	1.76	4.4
2	14 49.8	14 48.7	54 19.0	0.45	54 14.7	−0.26	4 14.9	1.72	5.4
3	14 48.2	14 48.3	54 12.8	−0.05	54 13.3	+0.15	4 56.0	1.72	6.4
4	14 49.2	14 50.7	54 16.5	+0.37	54 22.2	+0.58	5 37.6	1.75	7.4
5	14 53.0	14 55.9	54 30.5	0.80	54 41.3	1.00	6 20.4	1.82	8.4
6	14 59.5	15 3.7	54 54.5	1.20	55 10.0	1.38	7 5.4	1.93	9.4
7	15 8.5	15 13.8	55 27.6	+1.54	55 47.0	+1.68	7 53.2	2.06	10.4
8	15 19.5	15 25.6	56 8.1	1.80	56 30.3	1.89	8 44.2	2.19	11.4
9	15 31.9	15 38.3	56 53.4	1.94	57 17.0	1.96	9 38.3	2.30	12.4
10	15 44.7	15 50.9	57 40.4	+1.93	58 3.4	+1.88	10 34.5	2.37	13.4
11	15 56.9	16 2.5	58 25.4	1.77	58 46.0	1.63	11 31.7	2.38	14.4
12	16 7.6	16 12.0	59 4.6	1.45	59 20.9	1.25	12 28.5	2.34	15.4
13	16 15.8	16 18.7	59 34.7	+1.02	59 45.5	+0.78	13 24.0	2.28	16.4
14	16 20.9	16 22.2	59 53.4	0.53	59 58.2	+0.28	14 17.8	2.21	17.4
15	16 22.7	16 22.4	60 0.1	+0.03	59 59.1	−0.19	15 10.1	2.16	18.4
16	16 21.4	16 19.8	59 55.4	−0.40	59 49.3	−0.59	16 1.7	2.14	19.4
17	16 17.6	16 14.9	59 41.2	0.75	59 31.3	0.89	16 53.2	2.16	20.4
18	16 11.7	16 8.3	59 19.8	1.00	59 7.2	1.09	17 45.6	2.20	21.4
19	16 4.6	16 0.7	58 53.7	−1.15	58 39.4	−1.20	18 39.1	2.26	22.4
20	15 56.7	15 52.7	58 24.7	1.24	58 9.7	1.26	19 33.9	2.30	23.4
21	15 48.5	15 44.3	57 54.4	1.28	57 39.0	1.28	20 29.4	2.32	24.4
22	15 40.1	15 35.9	57 23.5	−1.29	57 8.1	−1.28	21 24.7	2.28	25.4
23	15 31.7	15 27.5	56 52.7	1.28	56 37.4	1.27	22 18.6	2.20	26.4
24	15 23.4	15 19.3	56 22.2	1.25	56 7.3	1.23	23 10.2	2.09	27.4
25	15 15.3	15 11.4	55 52.6	−1.21	55 38.3	−1.17	23 59.1	1.98	28.4
26	15 7.6	15 4.1	55 24.4	1.13	55 11.2	1.07	6		29.4
27	15 0.7	14 57.5	54 58.7	1.00	54 47.1	0.92	0 45.2	1.87	0.9
28	14 54.6	14 52.1	54 36.6	−0.83	54 27.3	−0.71	1 29.1	1.79	1.9
29	14 50.0	14 48.3	54 19.5	0.59	54 13.2	0.45	2 11.3	1.73	2.9
30	14 47.0	14 46.4	54 8.7	−0.29	54 6.2	−0.13	2 52.7	1.71	3.9
31	14 46.2	14 46.7	54 5.7	+0.05	54 7.4	+0.24	3 33.9	1.73	4.9
32	14 47.8	14 49.6	54 11.5	+0.44	54 18.0	+0.64	4 15.9	1.78	5.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	SUNDAY 1.					TUESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 3 32.44	1.8798	N. 6 26 37.4	10.943	0	11 32 1.48	1.8293	S. 2 28 53.8	11.133
1	10 5 25.16	1.8775	6 15 40.2	10.963	1	11 33 51.25	1.8297	2 40 1.4	11.122
2	10 7 17.74	1.8752	6 4 41.9	10.981	2	11 35 41.05	1.8303	2 51 8.4	11.111
3	10 9 10.18	1.8728	5 53 42.5	10.998	3	11 37 30.88	1.8308	3 2 14.7	11.098
4	10 11 2.48	1.8706	5 42 42.1	11.015	4	11 39 20.74	1.8313	3 13 20.2	11.086
5	10 12 54.65	1.8684	5 31 40.7	11.032	5	11 41 10.64	1.8320	3 24 25.0	11.073
6	10 14 46.69	1.8663	5 20 38.3	11.047	6	11 43 0.58	1.8327	3 35 29.0	11.059
7	10 16 38.61	1.8643	5 9 35.1	11.062	7	11 44 50.56	1.8334	3 46 32.1	11.045
8	10 18 30.40	1.8622	4 58 30.9	11.077	8	11 46 40.59	1.8343	3 57 34.4	11.030
9	10 20 22.07	1.8603	4 47 25.9	11.090	9	11 48 30.67	1.8351	4 8 35.7	11.014
10	10 22 13.63	1.8584	4 36 20.1	11.103	10	11 50 20.80	1.8360	4 19 36.1	10.999
11	10 24 5.08	1.8566	4 25 13.6	11.115	11	11 52 10.99	1.8371	4 30 35.6	10.983
12	10 25 56.42	1.8548	4 14 6.3	11.127	12	11 54 1.25	1.8382	4 41 34.1	10.966
13	10 27 47.65	1.8530	4 2 58.4	11.137	13	11 55 51.57	1.8392	4 52 31.5	10.948
14	10 29 38.78	1.8513	3 51 49.9	11.148	14	11 57 41.95	1.8403	5 3 27.9	10.930
15	10 31 29.81	1.8497	3 40 40.7	11.158	15	11 59 32.41	1.8416	5 14 23.1	10.911
16	10 33 20.74	1.8481	3 29 31.0	11.166	16	12 1 22.94	1.8428	5 25 17.2	10.892
17	10 35 11.58	1.8466	3 18 20.8	11.174	17	12 3 13.55	1.8443	5 36 10.1	10.872
18	10 37 2.33	1.8452	3 7 10.1	11.183	18	12 5 4.25	1.8457	5 47 1.8	10.851
19	10 38 53.00	1.8438	2 55 58.9	11.190	19	12 6 55.03	1.8471	5 57 52.2	10.829
20	10 40 43.59	1.8425	2 44 47.3	11.196	20	12 8 45.90	1.8486	6 8 41.3	10.808
21	10 42 34.10	1.8413	2 33 35.4	11.202	21	12 10 36.86	1.8502	6 19 29.1	10.786
22	10 44 24.54	1.8401	2 22 23.1	11.208	22	12 12 27.92	1.8518	6 30 15.6	10.763
23	10 46 14.91	1.8389	N. 2 11 10.5	11.212	23	12 14 19.08	1.8535	S. 6 41 0.6	10.738
	MONDAY 2.					WEDNESDAY 4.			
0	10 48 5.21	1.8378	N. 1 59 57.7	11.215	0	12 16 10.34	1.8553	S. 6 51 44.2	10.714
1	10 49 55.45	1.8368	1 48 44.7	11.219	1	12 18 1.71	1.8571	7 2 26.3	10.690
2	10 51 45.62	1.8358	1 37 31.3	11.222	2	12 19 53.19	1.8590	7 13 7.0	10.665
3	10 53 35.74	1.8349	1 26 17.9	11.223	3	12 21 44.79	1.8609	7 23 46.1	10.638
4	10 55 25.81	1.8341	1 15 4.5	11.225	4	12 23 36.50	1.8628	7 34 23.6	10.612
5	10 57 15.83	1.8333	1 3 50.9	11.227	5	12 25 28.33	1.8649	7 44 59.5	10.585
6	10 59 5.80	1.8325	0 52 37.3	11.227	6	12 27 20.29	1.8670	7 55 33.8	10.557
7	11 0 55.73	1.8318	0 41 23.7	11.227	7	12 29 12.37	1.8692	8 6 6.3	10.528
8	11 2 45.62	1.8313	0 30 10.1	11.226	8	12 31 4.59	1.8714	8 16 37.1	10.499
9	11 4 35.48	1.8307	0 18 56.6	11.225	9	12 32 56.94	1.8737	8 27 6.2	10.469
10	11 6 25.30	1.8301	N. 0 7 43.1	11.223	10	12 34 49.43	1.8759	8 37 33.4	10.438
11	11 8 15.09	1.8297	S. 0 3 30.1	11.219	11	12 36 42.05	1.8783	8 47 58.8	10.408
12	11 10 4.86	1.8293	0 14 43.2	11.217	12	12 38 34.82	1.8808	8 58 22.4	10.377
13	11 11 54.61	1.8290	0 25 56.1	11.213	13	12 40 27.74	1.8833	9 8 44.0	10.344
14	11 13 44.34	1.8287	0 37 8.7	11.208	14	12 42 20.81	1.8859	9 19 3.7	10.312
15	11 15 34.05	1.8285	0 48 21.0	11.203	15	12 44 14.04	1.8884	9 29 21.4	10.278
16	11 17 23.76	1.8284	0 59 33.0	11.198	16	12 46 7.42	1.8911	9 39 37.0	10.243
17	11 19 13.46	1.8283	1 10 44.7	11.192	17	12 48 0.97	1.8938	9 49 50.6	10.208
18	11 21 3.16	1.8283	1 21 56.0	11.185	18	12 49 54.68	1.8965	10 0 2.0	10.173
19	11 22 52.86	1.8283	1 33 6.9	11.178	19	12 51 48.55	1.8993	10 10 11.3	10.137
20	11 24 42.56	1.8284	1 44 17.3	11.170	20	12 53 42.60	1.9023	10 20 18.4	10.100
21	11 26 32.27	1.8286	1 55 27.3	11.162	21	12 55 36.83	1.9053	10 30 23.3	10.063
22	11 28 21.99	1.8288	2 6 36.7	11.152	22	12 57 31.23	1.9082	10 40 25.9	10.024
23	11 30 11.73	1.8291	2 17 45.5	11.143	23	12 59 25.81	1.9112	10 50 26.2	9.986
24	11 32 1.48	1.8293	S. 2 28 53.8	11.133	24	13 1 20.57	1.9143	S. 11 0 24.2	9.947

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 5.					**SATURDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 1 20.57	1.9143	S. 11 0 24.2	9.947	0	14 37 40.72	2.1147	S. 17 58 1.4	7.145
1	13 3 15.53	1.9175	11 10 19.8	9.906	1	14 39 47.75	2.1197	18 5 7.7	7.066
2	13 5 10.67	1.9207	11 20 12.9	9.864	2	14 41 55.08	2.1247	18 12 9.3	6.986
3	13 7 6.01	1.9239	11 30 3.5	9.823	3	14 44 2.71	2.1297	18 19 6.1	6.905
4	13 9 1.54	1.9272	11 39 51.7	9.781	4	14 46 10.64	2.1347	18 25 58.0	6.823
5	13 10 57.27	1.9306	11 49 37.3	9.738	5	14 48 18.87	2.1397	18 32 44.9	6.740
6	13 12 53.21	1.9340	11 59 20.2	9.693	6	14 50 27.40	2.1447	18 39 26.8	6.657
7	13 14 49.35	1.9373	12 9 0.5	9.649	7	14 52 36.23	2.1498	18 46 3.7	6.573
8	13 16 45.69	1.9408	12 18 38.1	9.604	8	14 54 45.37	2.1548	18 52 35.5	6.487
9	13 18 42.25	1.9445	12 28 13.0	9.558	9	14 56 54.81	2.1598	18 59 2.1	6.400
10	13 20 39.03	1.9481	12 37 45.1	9.511	10	14 59 4.55	2.1649	19 5 23.5	6.313
11	13 22 36.02	1.9516	12 47 14.3	9.463	11	15 1 14.60	2.1700	19 11 39.6	6.223
12	13 24 33.22	1.9552	12 56 40.7	9.416	12	15 3 24.95	2.1751	19 17 50.3	6.134
13	13 26 30.65	1.9591	13 6 4.2	9.367	13	15 5 35.61	2.1802	19 23 55.7	6.045
14	13 28 28.31	1.9628	13 15 24.7	9.317	14	15 7 46.57	2.1852	19 29 55.7	5.955
15	13 30 26.19	1.9667	13 24 42.2	9.267	15	15 9 57.83	2.1903	19 35 50.1	5.861
16	13 32 24.31	1.9706	13 33 56.7	9.216	16	15 12 9.40	2.1953	19 41 39.0	5.768
17	13 34 22.66	1.9746	13 43 8.1	9.163	17	15 14 21.27	2.2004	19 47 22.3	5.674
18	13 36 21.25	1.9786	13 52 16.3	9.111	18	15 16 33.45	2.2055	19 52 59.9	5.579
19	13 38 20.08	1.9826	14 1 21.4	9.058	19	15 18 45.93	2.2105	19 58 31.8	5.483
20	13 40 19.15	1.9866	14 10 23.2	9.003	20	15 20 58.71	2.2156	20 3 57.9	5.386
21	13 42 18.47	1.9907	14 19 21.7	8.948	21	15 23 11.80	2.2207	20 9 18.1	5.288
22	13 44 18.03	1.9948	14 28 16.9	8.892	22	15 25 25.19	2.2257	20 14 32.5	5.190
23	13 46 17.84	1.9990	S. 14 37 8.7	8.835	23	15 27 38.88	2.2306	S. 20 19 40.9	5.089
	FRIDAY 6.					**SUNDAY 8.**			
0	13 48 17.91	2.0033	S. 14 45 57.1	8.778	0	15 29 52.86	2.2356	S. 20 24 43.2	4.988
1	13 50 18.23	2.0075	14 54 42.0	8.719	1	15 32 7.15	2.2407	20 29 39.5	4.888
2	13 52 18.81	2.0118	15 3 23.4	8.661	2	15 34 21.74	2.2456	20 34 29.7	4.786
3	13 54 19.64	2.0161	15 12 1.3	8.601	3	15 36 36.62	2.2505	20 39 13.8	4.683
4	13 56 20.74	2.0205	15 20 35.5	8.540	4	15 38 51.80	2.2554	20 43 51.6	4.578
5	13 58 22.10	2.0249	15 29 6.1	8.478	5	15 41 7.27	2.2603	20 48 23.2	4.473
6	14 0 23.73	2.0294	15 37 32.9	8.416	6	15 43 23.04	2.2653	20 52 48.4	4.367
7	14 2 25.63	2.0338	15 45 56.0	8.353	7	15 45 39.10	2.2701	20 57 7.2	4.260
8	14 4 27.79	2.0383	15 54 15.2	8.288	8	15 47 56.45	2.2748	21 1 19.6	4.153
9	14 6 30.23	2.0429	16 2 30.6	8.223	9	15 50 12.08	2.2796	21 5 25.5	4.043
10	14 8 32.94	2.0475	16 10 42.0	8.158	10	15 52 29.00	2.2844	21 9 24.8	3.933
11	14 10 35.93	2.0522	16 18 49.5	8.091	11	15 54 46.21	2.2892	21 13 17.5	3.823
12	14 12 39.20	2.0568	16 26 52.9	8.023	12	15 57 3.70	2.2938	21 17 3.5	3.712
13	14 14 42.75	2.0615	16 34 52.3	7.955	13	15 59 21.47	2.2985	21 20 42.9	3.600
14	14 16 46.58	2.0662	16 42 47.5	7.886	14	16 1 39.52	2.3031	21 24 15.5	3.486
15	14 18 50.69	2.0709	16 50 38.6	7.816	15	16 3 57.84	2.3077	21 27 41.2	3.372
16	14 20 55.09	2.0757	16 58 25.4	7.745	16	16 6 16.44	2.3123	21 31 0.2	3.258
17	14 22 59.77	2.0804	17 6 8.0	7.673	17	16 8 35.31	2.3167	21 34 12.2	3.143
18	14 25 4.74	2.0853	17 13 46.2	7.600	18	16 10 54.44	2.3211	21 37 17.3	3.026
19	14 27 10.00	2.0902	17 21 20.0	7.527	19	16 13 13.84	2.3255	21 40 15.3	2.908
20	14 29 15.56	2.0951	17 28 49.4	7.453	20	16 15 33.50	2.3299	21 43 6.2	2.789
21	14 31 21.41	2.0999	17 36 14.3	7.377	21	16 17 53.43	2.3342	21 45 50.0	2.671
22	14 33 27.55	2.1048	17 43 34.6	7.300	22	16 20 13.61	2.3384	21 48 26.7	2.552
23	14 35 33.99	2.1098	17 50 50.3	7.223	23	16 22 34.04	2.3427	21 50 56.2	2.431
24	14 37 40.72	2.1147	S. 17 58 1.4	7.145	24	16 24 54.73	2.3468	S. 21 53 18.4	2.309

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.	Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
MONDAY 9.									WEDNESDAY 11.								
	h	m	s	s	°	′	″	″		h	m	s	s	°	′	″	″
0	16	24	54.73	2.3468	S.21	53	18.4	2.309	0	18	21	0.47	2.4593	S.21	13	28.1	4.102
1	16	27	15.66	2.3509	21	55	33.3	2.187	1	18	23	28.04	2.4596	21	9	17.9	4.238
2	16	29	36.84	2.3550	21	57	40.8	2.064	2	18	25	55.62	2.4597	21	4	59.5	4.376
3	16	31	58.26	2.3589	21	59	41.0	1.941	3	18	28	23.20	2.4598	21	0	32.8	4.513
4	16	34	19.91	2.3628	22	1	33.7	1.817	4	18	30	50.79	2.4598	20	55	58.0	4.649
5	16	36	41.80	2.3667	22	3	19.0	1.692	5	18	33	18.37	2.4597	20	51	14.9	4.787
6	16	39	3.91	2.3704	22	4	56.7	1.566	6	18	35	45.95	2.4595	20	46	23.6	4.923
7	16	41	26.25	2.3743	22	6	26.9	1.440	7	18	38	13.51	2.4593	20	41	24.2	5.058
8	16	43	48.82	2.3779	22	7	49.5	1.313	8	18	40	41.06	2.4590	20	36	16.7	5.193
9	16	46	11.60	2.3815	22	9	4.4	1.185	9	18	43	8.59	2.4586	20	31	1.1	5.328
10	16	48	34.60	2.3850	22	10	11.7	1.057	10	18	45	36.09	2.4581	20	25	37.4	5.463
11	16	50	57.80	2.3884	22	11	11.2	0.928	11	18	48	3.56	2.4574	20	20	5.6	5.597
12	16	53	21.21	2.3918	22	12	3.0	0.798	12	18	50	30.98	2.4568	20	14	25.8	5.730
13	16	55	44.82	2.3952	22	12	47.0	0.668	13	18	52	58.37	2.4561	20	8	38.0	5.863
14	16	58	8.63	2.3984	22	13	23.2	0.538	14	18	55	25.71	2.4553	20	2	42.2	5.996
15	17	0	32.63	2.4016	22	13	51.5	0.407	15	18	57	53.00	2.4544	19	56	38.5	6.128
16	17	2	56.82	2.4047	22	14	12.0	0.275	16	19	0	20.24	2.4534	19	50	26.9	6.259
17	17	5	21.19	2.4077	22	14	24.5	0.142	17	19	2	47.41	2.4523	19	44	7.4	6.390
18	17	7	45.74	2.4106	22	14	29.0	− 0.009	18	19	5	14.52	2.4513	19	37	40.1	6.521
19	17	10	10.46	2.4135	22	14	25.6	+ 0.123	19	19	7	41.57	2.4502	19	31	4.9	6.651
20	17	12	35.36	2.4163	22	14	14.2	0.258	20	19	10	8.54	2.4488	19	24	22.0	6.779
21	17	15	0.42	2.4190	22	13	54.7	0.392	21	19	12	35.43	2.4476	19	17	31.4	6.908
22	17	17	25.64	2.4216	22	13	27.2	0.526	22	19	15	2.25	2.4463	19	10	33.1	7.035
23	17	19	51.01	2.4241	S.22	12	51.6	0.661	23	19	17	28.98	2.4448	S.19	3	27.2	7.162
TUESDAY 10.									THURSDAY 12.								
0	17	22	16.53	2.4266	S.22	12	7.9	0.796	0	19	19	55.62	2.4433	S.18	56	13.7	7.288
1	17	24	42.20	2.4290	22	11	16.1	0.932	1	19	22	22.17	2.4417	18	48	52.6	7.413
2	17	27	8.01	2.4313	22	10	16.1	1.068	2	19	24	48.62	2.4401	18	41	24.1	7.538
3	17	29	33.95	2.4334	22	9	7.9	1.204	3	19	27	14.98	2.4384	18	33	48.1	7.662
4	17	32	0.02	2.4355	22	7	51.6	1.341	4	19	29	41.23	2.4366	18	26	4.7	7.784
5	17	34	26.21	2.4375	22	6	27.0	1.478	5	19	32	7.37	2.4348	18	18	14.0	7.906
6	17	36	52.52	2.4395	22	4	54.2	1.615	6	19	34	33.41	2.4331	18	10	16.0	8.028
7	17	39	18.95	2.4414	22	3	13.2	1.753	7	19	36	59.34	2.4312	18	2	10.7	8.148
8	17	41	45.49	2.4432	22	1	23.9	1.890	8	19	39	25.15	2.4292	17	53	58.2	8.267
9	17	44	12.13	2.4448	21	59	26.4	2.028	9	19	41	50.84	2.4272	17	45	38.6	8.385
10	17	46	38.87	2.4464	21	57	20.6	2.166	10	19	44	16.41	2.4252	17	37	12.0	8.502
11	17	49	5.70	2.4478	21	55	6.5	2.304	11	19	46	41.86	2.4231	17	28	38.4	8.618
12	17	51	32.61	2.4493	21	52	44.1	2.443	12	19	49	7.18	2.4209	17	19	57.8	8.734
13	17	53	59.61	2.4507	21	50	13.4	2.580	13	19	51	32.37	2.4188	17	11	10.3	8.848
14	17	56	26.69	2.4518	21	47	34.5	2.718	14	19	53	57.43	2.4165	17	2	16.0	8.962
15	17	58	53.83	2.4529	21	44	47.2	2.858	15	19	56	22.35	2.4142	16	53	14.8	9.074
16	18	1	21.04	2.4540	21	41	51.6	2.996	16	19	58	47.13	2.4119	16	44	7.0	9.184
17	18	3	48.31	2.4550	21	38	47.7	3.134	17	20	1	11.78	2.4096	16	34	52.6	9.295
18	18	6	15.64	2.4559	21	35	35.5	3.273	18	20	3	36.28	2.4072	16	25	31.6	9.404
19	18	8	43.02	2.4567	21	32	15.0	3.411	19	20	6	0.64	2.4048	16	16	4.1	9.513
20	18	11	10.44	2.4573	21	28	46.2	3.549	20	20	8	24.85	2.4023	16	6	30.1	9.619
21	18	13	37.90	2.4579	21	25	9.1	3.688	21	20	10	48.92	2.3999	15	56	49.8	9.724
22	18	16	5.39	2.4585	21	21	23.7	3.825	22	20	13	12.84	2.3974	15	47	3.2	9.828
23	18	18	32.92	2.4590	21	17	30.1	3.963	23	20	15	36.61	2.3949	15	37	10.4	9.931
24	18	21	0.47	2.4593	S.21	13	28.1	4.102	24	20	18	0.23	2.3923	S.15	27	11.5	10.033

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 13.					SUNDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 18 0.23	2.3923	S.15 27 11.5	10.033	0	22 9 50.31	2.2728	S. 5 53 25.2	13.327
1	20 20 23.69	2.3898	15 17 6.5	10.134	1	22 12 6.62	2.2708	5 40 4.6	13.359
2	20 22 47.00	2.3873	15 6 55.4	10.234	2	22 14 22.81	2.2689	5 26 42.1	13.391
3	20 25 10.16	2.3847	14 56 38.4	10.333	3	22 16 38.89	2.2672	5 13 17.7	13.421
4	20 27 33.16	2.3820	14 46 15.5	10.429	4	22 18 54.87	2.2654	4 59 51.6	13.449
5	20 29 56.00	2.3793	14 35 46.9	10.525	5	22 21 10.74	2.2637	4 46 23.8	13.476
6	20 32 18.68	2.3766	14 25 12.5	10.620	6	22 23 26.51	2.2619	4 32 54.5	13.501
7	20 34 41.20	2.3741	14 14 32.5	10.713	7	22 25 42.17	2.2603	4 19 23.7	13.526
8	20 37 3.57	2.3714	14 3 47.0	10.804	8	22 27 57.74	2.2588	4 5 51.4	13.548
9	20 39 25.77	2.3687	13 52 56.0	10.895	9	22 30 13.22	2.2572	3 52 17.9	13.568
10	20 41 47.81	2.3660	13 41 59.6	10.985	10	22 32 28.60	2.2557	3 38 43.2	13.588
11	20 44 9.69	2.3633	13 30 57.8	11.073	11	22 34 43.90	2.2542	3 25 7.3	13.607
12	20 46 31.41	2.3607	13 19 50.8	11.160	12	22 36 59.10	2.2527	3 11 30.4	13.623
13	20 48 52.97	2.3579	13 8 38.6	11.245	13	22 39 14.22	2.2513	2 57 52.6	13.638
14	20 51 14.36	2.3552	12 57 21.4	11.328	14	22 41 29.26	2.2501	2 44 13.9	13.652
15	20 53 35.59	2.3525	12 45 59.2	11.411	15	22 43 44.23	2.2488	2 30 34.4	13.664
16	20 55 56.66	2.3498	12 34 32.1	11.492	16	22 45 59.12	2.2475	2 16 54.2	13.674
17	20 58 17.57	2.3472	12 23 0.2	11.572	17	22 48 13.93	2.2463	2 3 13.5	13.683
18	21 0 38.32	2.3444	12 11 23.5	11.651	18	22 50 28.68	2.2453	1 49 32.2	13.692
19	21 2 58.90	2.3418	11 59 42.1	11.728	19	22 52 43.36	2.2442	1 35 50.4	13.698
20	21 5 19.33	2.3391	11 47 56.2	11.803	20	22 54 57.98	2.2432	1 22 8.4	13.703
21	21 7 39.59	2.3364	11 36 5.7	11.878	21	22 57 12.55	2.2423	1 8 26.1	13.707
22	21 9 59.70	2.3338	11 24 10.9	11.950	22	22 59 27.05	2.2413	0 54 43.6	13.708
23	21 12 19.65	2.3312	S.11 12 11.7	12.021	23	23 1 41.50	2.2403	S. 0 41 1.1	13.708
	SATURDAY 14.					MONDAY 16.			
0	21 14 39.44	2.3285	S.11 0 8.4	12.090	0	23 3 55.89	2.2395	S. 0 27 18.6	13.708
1	21 16 59.07	2.3259	10 48 0.8	12.159	1	23 6 10.24	2.2388	S. 0 13 36.2	13.705
2	21 19 18.55	2.3233	10 35 49.2	12.227	2	23 8 24.55	2.2381	N. 0 0 6.0	13.702
3	21 21 37.87	2.3208	10 23 33.6	12.292	3	23 10 38.81	2.2374	0 13 48.0	13.697
4	21 23 57.04	2.3182	10 11 14.2	12.355	4	23 12 53.04	2.2368	0 27 29.6	13.690
5	21 26 16.05	2.3156	9 58 51.0	12.418	5	23 15 7.23	2.2362	0 41 10.8	13.682
6	21 28 34.91	2.3131	9 46 24.0	12.480	6	23 17 21.38	2.2357	0 54 51.4	13.673
7	21 30 53.62	2.3106	9 33 53.4	12.539	7	23 19 35.51	2.2353	1 8 31.5	13.662
8	21 33 12.18	2.3082	9 21 19.3	12.597	8	23 21 49.62	2.2349	1 22 10.8	13.649
9	21 35 30.60	2.3058	9 8 41.8	12.653	9	23 24 3.70	2.2345	1 35 49.4	13.637
10	21 37 48.87	2.3033	8 56 0.9	12.709	10	23 26 17.76	2.2342	1 49 27.2	13.622
11	21 40 6.99	2.3008	8 43 16.7	12.763	11	23 28 31.80	2.2339	2 3 4.0	13.604
12	21 42 24.97	2.2985	8 30 29.3	12.815	12	23 30 45.83	2.2338	2 16 39.7	13.587
13	21 44 42.81	2.2962	8 17 38.9	12.866	13	23 32 59.85	2.2336	2 30 14.4	13.568
14	21 47 0.51	2.2938	8 4 45.4	12.916	14	23 35 13.86	2.2335	2 43 47.8	13.547
15	21 49 18.07	2.2916	7 51 49.0	12.963	15	23 37 27.87	2.2335	2 57 20.0	13.526
16	21 51 35.50	2.2894	7 38 49.8	13.009	16	23 39 41.88	2.2335	3 10 50.9	13.503
17	21 53 52.80	2.2872	7 25 47.9	13.054	17	23 41 55.89	2.2336	3 24 20.3	13.478
18	21 56 9.96	2.2850	7 12 43.3	13.098	18	23 44 9.91	2.2337	3 37 48.2	13.452
19	21 58 27.00	2.2829	6 59 36.2	13.139	19	23 46 23.93	2.2338	3 51 14.5	13.424
20	22 0 43.91	2.2808	6 46 26.6	13.180	20	23 48 37.97	2.2341	4 4 39.1	13.396
21	22 3 0.69	2.2787	6 33 14.6	13.219	21	23 50 52.02	2.2343	4 18 2.0	13.366
22	22 5 17.35	2.2767	6 20 0.3	13.257	22	23 53 6.09	2.2346	4 31 23.0	13.335
23	22 7 33.89	2.2747	6 6 43.8	13.293	23	23 55 20.17	2.2349	4 44 42.2	13.302
24	22 9 50.31	2.2728	S. 5 53 25.2	13.327	24	23 57 34.28	2.2354	N. 4 57 59.3	13.268

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	TUESDAY 17.					THURSDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 57 34.28	2.2354	N. 4 57 59.3	13.268	0	1 46 10.57	2.3030	N.14 31 58.5	10.198
1	23 59 48.42	2.2359	5 11 14.3	13.233	1	1 48 28.81	2.3050	14 42 7.6	10.105
2	0 2 2.59	2.2364	5 24 27.2	13.197	2	1 50 47.17	2.3070	14 52 11.1	10.013
3	0 4 16.79	2.2369	5 37 37.9	13.158	3	1 53 5.65	2.3091	15 2 9.1	9.919
4	0 6 31.02	2.2376	5 50 46.2	13.118	4	1 55 24.26	2.3112	15 12 1.4	9.824
5	0 8 45.30	2.2383	6 3 52.1	13.078	5	1 57 42.99	2.3133	15 21 48.0	9.729
6	0 10 59.61	2.2389	6 16 55.6	13.037	6	2 0 1.85	2.3154	15 31 28.9	9.633
7	0 13 13.97	2.2397	6 29 56.5	12.993	7	2 2 20.84	2.3175	15 41 4.0	9.536
8	0 15 28.38	2.2406	6 42 54.8	12.950	8	2 4 39.95	2.3195	15 50 33.2	9.438
9	0 17 42.84	2.2414	6 55 50.5	12.904	9	2 6 59.18	2.3216	15 59 56.5	9.339
10	0 19 57.35	2.2423	7 8 43.3	12.857	10	2 9 18.54	2.3237	16 9 13.9	9.239
11	0 22 11.91	2.2432	7 21 33.3	12.809	11	2 11 38.02	2.3258	16 18 25.2	9.138
12	0 24 26.53	2.2442	7 34 20.4	12.760	12	2 13 57.63	2.3279	16 27 30.4	9.036
13	0 26 41.21	2.2453	7 47 4.5	12.709	13	2 16 17.37	2.3300	16 36 29.5	8.933
14	0 28 55.96	2.2463	7 59 45.5	12.657	14	2 18 37.23	2.3320	16 45 22.4	8.830
15	0 31 10.77	2.2474	8 12 23.3	12.603	15	2 20 57.21	2.3340	16 54 9.1	8.725
16	0 33 25.65	2.2486	8 24 57.9	12.549	16	2 23 17.31	2.3361	17 2 49.4	8.619
17	0 35 40.60	2.2498	8 37 29.2	12.494	17	2 25 37.54	2.3382	17 11 23.4	8.513
18	0 37 55.62	2.2510	8 49 57.2	12.438	18	2 27 57.89	2.3401	17 19 51.0	8.407
19	0 40 10.72	2.2523	9 2 21.7	12.378	19	2 30 18.35	2.3421	17 28 12.2	8.299
20	0 42 25.90	2.2536	9 14 42.6	12.319	20	2 32 38.94	2.3442	17 36 26.9	8.190
21	0 44 41.15	2.2549	9 27 0.0	12.259	21	2 34 59.65	2.3461	17 44 35.0	8.081
22	0 46 56.49	2.2564	9 39 13.7	12.198	22	2 37 20.47	2.3480	17 52 36.6	7.971
23	0 49 11.92	2.2578	N. 9 51 23.7	12.135	23	2 39 41.41	2.3500	N.18 0 31.5	7.859
	WEDNESDAY 18.					FRIDAY 20.			
0	0 51 27.43	2.2593	N.10 3 29.9	12.071	0	2 42 2.47	2.3519	N.18 8 19.7	7.748
1	0 53 43.03	2.2608	10 15 32.2	12.006	1	2 44 23.64	2.3538	18 16 1.3	7.635
2	0 55 58.72	2.2623	10 27 30.6	11.939	2	2 46 44.92	2.3556	18 23 36.0	7.522
3	0 58 14.51	2.2639	10 39 24.9	11.871	3	2 49 6.31	2.3574	18 31 3.9	7.408
4	1 0 30.39	2.2655	10 51 15.1	11.803	4	2 51 27.81	2.3593	18 38 24.9	7.293
5	1 2 46.37	2.2671	11 3 1.2	11.733	5	2 53 49.42	2.3611	18 45 39.0	7.178
6	1 5 2.44	2.2688	11 14 43.1	11.663	6	2 56 11.14	2.3628	18 52 46.2	7.061
7	1 7 18.62	2.2705	11 26 20.7	11.590	7	2 58 32.96	2.3645	18 59 46.3	6.943
8	1 9 34.90	2.2723	11 37 54.0	11.517	8	3 0 54.88	2.3662	19 6 39.4	6.827
9	1 11 51.29	2.2740	11 49 22.8	11.443	9	3 3 16.90	2.3678	19 13 25.5	6.709
10	1 14 7.78	2.2758	12 0 47.1	11.368	10	3 5 39.02	2.3694	19 20 4.5	6.590
11	1 16 24.38	2.2776	12 12 6.9	11.291	11	3 8 1.23	2.3710	19 26 36.3	6.470
12	1 18 41.09	2.2794	12 23 22.0	11.213	12	3 10 23.54	2.3726	19 33 0.9	6.350
13	1 20 57.91	2.2813	12 34 32.4	11.134	13	3 12 45.94	2.3741	19 39 18.3	6.229
14	1 23 14.84	2.2831	12 45 38.1	11.054	14	3 15 8.43	2.3755	19 45 28.4	6.108
15	1 25 31.88	2.2850	12 56 38.9	10.973	15	3 17 31.00	2.3768	19 51 31.3	5.987
16	1 27 49.04	2.2869	13 7 34.8	10.890	16	3 19 53.65	2.3783	19 57 26.9	5.865
17	1 30 6.31	2.2888	13 18 25.7	10.808	17	3 22 16.39	2.3796	20 3 15.1	5.742
18	1 32 23.70	2.2908	13 29 11.7	10.723	18	3 24 39.20	2.3808	20 8 55.9	5.618
19	1 34 41.21	2.2928	13 39 52.5	10.638	19	3 27 2.09	2.3821	20 14 29.2	5.493
20	1 36 58.84	2.2948	13 50 28.2	10.552	20	3 29 25.05	2.3833	20 19 55.1	5.370
21	1 39 16.59	2.2968	14 0 58.7	10.465	21	3 31 48.08	2.3844	20 25 13.6	5.246
22	1 41 34.46	2.2988	14 11 24.0	10.377	22	3 34 11.18	2.3855	20 30 24.6	5.120
23	1 43 52.45	2.3009	14 21 43.9	10.288	23	3 36 34.34	2.3865	20 35 28.0	4.993
24	1 46 10.57	2.3030	N.14 31 58.5	10.198	24	3 38 57.56	2.3875	N.20 40 23.8	4.868

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute	Declination.	Diff. for 1 Minute.
	SATURDAY 21.					MONDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 38 57.56	2.3875	N.20 40 23.8	4.868	0	5 33 27.28	2.3563	N.22 4 54.8	1.339
1	3 41 20.84	2.3884	20 45 12.1	4.742	1	5 35 48.59	2.3540	22 3 30.7	1.464
2	3 43 44.17	2.3893	20 49 52.8	4.614	2	5 38 9.76	2.3516	22 1 59.1	1.589
3	3 46 7.55	2.3900	20 54 25.8	4.487	3	5 40 30.78	2.3490	22 0 20.0	1.713
4	3 48 30.97	2.3908	20 58 51.2	4.360	4	5 42 51.64	2.3464	21 58 33.5	1.837
5	3 50 54.44	2.3915	21 3 9.0	4.233	5	5 45 12.35	2.3438	21 56 39.6	1.960
6	3 53 17.95	2.3921	21 7 19.1	4.103	6	5 47 32.90	2.3411	21 54 38.3	2.083
7	3 55 41.49	2.3926	21 11 21.4	3.974	7	5 49 53.28	2.3383	21 52 29.6	2.206
8	3 58 5.06	2.3931	21 15 16.0	3.846	8	5 52 13.50	2.3356	21 50 13.6	2.327
9	4 0 28.66	2.3936	21 19 2.9	3.717	9	5 54 33.55	2.3327	21 47 50.4	2.448
10	4 2 52.29	2.3940	21 22 42.0	3.588	10	5 56 53.42	2.3298	21 45 19.9	2.568
11	4 5 15.94	2.3943	21 26 13.5	3.458	11	5 59 13.12	2.3268	21 42 42.2	2.688
12	4 7 39.60	2.3945	21 29 37.0	3.328	12	6 1 32.64	2.3238	21 39 57.3	2.808
13	4 10 3.28	2.3947	21 32 52.8	3.198	13	6 3 51.97	2.3206	21 37 5.3	2.927
14	4 12 26.97	2.3948	21 36 0.7	3.067	14	6 6 11.11	2.3174	21 34 6.1	3.045
15	4 14 50.66	2.3948	21 39 0.8	2.937	15	6 8 30.06	2.3142	21 30 59.9	3.162
16	4 17 14.35	2.3948	21 41 53.1	2.807	16	6 10 48.81	2.3109	21 27 46.7	3.278
17	4 19 38.04	2.3948	21 44 37.6	2.676	17	6 13 7.37	2.3076	21 24 26.5	3.395
18	4 22 1.72	2.3946	21 47 14.2	2.544	18	6 15 25.72	2.3042	21 20 59.3	3.511
19	4 24 25.39	2.3943	21 49 42.9	2.413	19	6 17 43.87	2.3008	21 17 25.2	3.625
20	4 26 49.04	2.3940	21 52 3.8	2.283	20	6 20 1.81	2.2972	21 13 44.3	3.739
21	4 29 12.67	2.3936	21 54 16.9	2.153	21	6 22 19.53	2.2937	21 9 56.5	3.853
22	4 31 36.27	2.3932	21 56 22.1	2.021	22	6 24 37.05	2.2902	21 6 2.0	3.965
23	4 33 59.85	2.3928	N.21 58 19.4	1.890	23	6 26 54.35	2.2865	N.21 2 0.7	4.077
	SUNDAY 22.					TUESDAY 24.			
0	4 36 23.40	2.3922	N.22 0 8.9	1.759	0	6 29 11.43	2.2828	N.20 57 52.7	4.188
1	4 38 46.91	2.3915	22 1 50.5	1.628	1	6 31 28.29	2.2792	20 53 38.1	4.298
2	4 41 10.38	2.3908	22 3 24.2	1.497	2	6 33 44.93	2.2754	20 49 16.9	4.408
3	4 43 33.80	2.3899	22 4 50.1	1.366	3	6 36 1.34	2.2716	20 44 49.1	4.518
4	4 45 57.17	2.3890	22 6 8.1	1.235	4	6 38 17.52	2.2678	20 40 14.8	4.625
5	4 48 20.48	2.3881	22 7 18.3	1.104	5	6 40 33.47	2.2638	20 35 34.1	4.733
6	4 50 43.74	2.3871	22 8 20.6	0.973	6	6 42 49.18	2.2599	20 30 46.9	4.839
7	4 53 6.93	2.3860	22 9 15.1	0.843	7	6 45 4.66	2.2561	20 25 53.4	4.945
8	4 55 30.06	2.3848	22 10 1.8	0.713	8	6 47 19.91	2.2521	20 20 53.5	5.050
9	4 57 53.11	2.3836	22 10 40.6	0.583	9	6 49 34.91	2.2480	20 15 47.4	5.153
10	5 0 16.09	2.3823	22 11 11.7	0.453	10	6 51 49.67	2.2439	20 10 35.1	5.257
11	5 2 38.98	2.3808	22 11 34.9	0.322	11	6 54 4.18	2.2398	20 5 16.6	5.359
12	5 5 1.79	2.3794	22 11 50.3	0.193	12	6 56 18.45	2.2358	19 59 52.0	5.461
13	5 7 24.51	2.3778	22 11 58.0	+ 0.063	13	6 58 32.48	2.2317	19 54 21.3	5.562
14	5 9 47.13	2.3763	22 11 57.9	− 0.066	14	7 0 46.25	2.2275	19 48 44.6	5.661
15	5 12 9.66	2.3746	22 11 50.1	0.194	15	7 2 59.78	2.2234	19 43 2.0	5.759
16	5 14 32.08	2.3728	22 11 34.6	0.323	16	7 5 13.06	2.2192	19 37 13.5	5.858
17	5 16 54.40	2.3711	22 11 11.4	0.451	17	7 7 26.08	2.2149	19 31 19.1	5.955
18	5 19 16.61	2.3692	22 10 40.5	0.579	18	7 9 38.85	2.2107	19 25 18.9	6.051
19	5 21 38.70	2.3672	22 10 1.9	0.707	19	7 11 51.36	2.2063	19 19 13.0	6.147
20	5 24 0.67	2.3652	22 9 15.7	0.834	20	7 14 3.61	2.2021	19 13 1.3	6.242
21	5 26 22.52	2.3631	22 8 21.8	0.961	21	7 16 15.61	2.1978	19 6 44.0	6.334
22	5 28 44.24	2.3609	22 7 20.4	1.087	22	7 18 27.35	2.1935	19 0 21.2	6.427
23	5 31 5.83	2.3587	22 6 11.4	1.213	23	7 20 38.83	2.1891	18 53 52.8	6.519
24	5 33 27.28	2.3563	N.22 4 54.8	1.339	24	7 22 50.04	2.1848	N.18 47 18.9	6.610

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 25.			
	h m s	s	° ′ ″	″
0	7 22 50.04	2.1848	N.18 47 18.9	6.610
1	7 25 1.00	2.1804	18 40 39.6	6.699
2	7 27 11.69	2.1760	18 33 55.0	6.788
3	7 29 22.12	2.1717	18 27 5.0	6.877
4	7 31 32.29	2.1673	18 20 9.8	6.963
5	7 33 42.19	2.1628	18 13 9.4	7.050
6	7 35 51.83	2.1585	18 6 3.8	7.135
7	7 38 1.21	2.1541	17 58 53.2	7.219
8	7 40 10.32	2.1497	17 51 37.5	7.303
9	7 42 19.17	2.1453	17 44 16.8	7.386
10	7 44 27.75	2.1408	17 36 51.2	7.468
11	7 46 36.07	2.1364	17 29 20.7	7.548
12	7 48 44.12	2.1320	17 21 45.5	7.627
13	7 50 51.91	2.1276	17 14 5.5	7.706
14	7 52 59.43	2.1232	17 6 20.8	7.783
15	7 55 6.69	2.1188	16 58 31.5	7.860
16	7 57 13.68	2.1144	16 50 37.5	7.937
17	7 59 20.41	2.1100	16 42 39.0	8.012
18	8 1 26.88	2.1056	16 34 36.1	8.085
19	8 3 33.08	2.1012	16 26 28.8	8.158
20	8 5 39.02	2.0968	16 18 17.1	8.230
21	8 7 44.70	2.0925	16 10 1.2	8.301
22	8 9 50.12	2.0882	16 1 41.0	8.372
23	8 11 55.28	2.0838	N.15 53 16.6	8.442
	THURSDAY 26.			
0	8 14 0.17	2.0794	N.15 44 48.0	8.510
1	8 16 4.81	2.0753	15 36 15.4	8.577
2	8 18 9.20	2.0710	15 27 38.8	8.643
3	8 20 13.33	2.0667	15 18 58.3	8.708
4	8 22 17.20	2.0624	15 10 13.8	8.773
5	8 24 20.82	2.0583	15 1 25.5	8.837
6	8 26 24.19	2.0540	14 52 33.4	8.899
7	8 28 27.30	2.0498	14 43 37.6	8.961
8	8 30 30.16	2.0456	14 34 38.1	9.022
9	8 32 32.77	2.0415	14 25 35.0	9.082
10	8 34 35.14	2.0374	14 16 28.3	9.141
11	8 36 37.26	2.0333	14 7 18.1	9.198
12	8 38 39.13	2.0292	13 58 4.5	9.255
13	8 40 40.76	2.0252	13 48 47.5	9.312
14	8 42 42.15	2.0212	13 39 27.1	9.368
15	8 44 43.30	2.0172	13 30 3.4	9.422
16	8 46 44.21	2.0133	13 20 36.5	9.474
17	8 48 44.89	2.0093	13 11 6.5	9.527
18	8 50 45.33	2.0054	13 1 33.3	9.579
19	8 52 45.54	2.0015	12 51 57.0	9.630
20	8 54 45.51	1.9977	12 42 17.7	9.680
21	8 56 45.26	1.9939	12 32 35.4	9.728
22	8 58 44.78	1.9901	12 22 50.3	9.776
23	9 0 44.07	1.9863	12 13 2.3	9.823
24	9 2 43.13	1.9826	N.12 3 11.5	9.870

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 27.			
	h m s	s	° ′ ″	″
0	9 2 43.13	1.9826	N.12 3 11.5	9.870
1	9 4 41.98	1.9789	11 53 17.9	9.916
2	9 6 40.60	1.9753	11 43 21.6	9.960
3	9 8 39.01	1.9718	11 33 22.7	10.003
4	9 10 37.21	1.9682	11 23 21.2	10.047
5	9 12 35.19	1.9646	11 13 17.1	10.089
6	9 14 32.96	1.9611	11 3 10.5	10.130
7	9 16 30.52	1.9577	10 53 1.4	10.170
8	9 18 27.88	1.9543	10 42 50.0	10.209
9	9 20 25.03	1.9509	10 32 36.3	10.248
10	9 22 21.98	1.9475	10 22 20.2	10.287
11	9 24 18.73	1.9443	10 12 1.9	10.323
12	9 26 15.29	1.9410	10 1 41.5	10.358
13	9 28 11.65	1.9378	9 51 18.9	10.394
14	9 30 7.82	1.9346	9 40 54.2	10.428
15	9 32 3.80	1.9314	9 30 27.5	10.462
16	9 33 59.59	1.9283	9 19 58.8	10.495
17	9 35 55.20	1.9253	9 9 28.1	10.528
18	9 37 50.63	1.9223	8 58 55.5	10.558
19	9 39 45.88	1.9193	8 48 21.1	10.588
20	9 41 40.95	1.9164	8 37 44.9	10.618
21	9 43 35.85	1.9136	8 27 6.9	10.648
22	9 45 30.58	1.9108	8 16 27.2	10.675
23	9 47 25.14	1.9079	N. 8 5 45.9	10.703
	SATURDAY 28.			
0	9 49 19.53	1.9052	N. 7 55 2.9	10.729
1	9 51 13.76	1.9025	7 44 18.4	10.754
2	9 53 7.83	1.8998	7 33 32.4	10.779
3	9 55 1.74	1.8973	7 22 44.9	10.804
4	9 56 55.50	1.8947	7 11 55.9	10.828
5	9 58 49.10	1.8922	7 1 5.6	10.849
6	10 0 42.56	1.8898	6 50 14.0	10.871
7	10 2 35.87	1.8873	6 39 21.1	10.893
8	10 4 29.04	1.8849	6 28 26.9	10.913
9	10 6 22.06	1.8826	6 17 31.5	10.933
10	10 8 14.95	1.8803	6 6 35.0	10.951
11	10 10 7.70	1.8782	5 55 37.4	10.969
12	10 12 0.33	1.8760	5 44 38.7	10.987
13	10 13 52.82	1.8738	5 33 39.0	11.003
14	10 15 45.19	1.8718	5 22 38.3	11.019
15	10 17 37.43	1.8697	5 11 36.7	11.035
16	10 19 29.55	1.8678	5 0 34.1	11.049
17	10 21 21.56	1.8659	4 49 30.8	11.063
18	10 23 13.46	1.8640	4 38 26.6	11.077
19	10 25 5.24	1.8621	4 27 21.6	11.089
20	10 26 56.91	1.8603	4 16 15.9	11.101
21	10 28 48.48	1.8586	4 5 9.5	11.112
22	10 30 39.94	1.8569	3 54 2.5	11.122
23	10 32 31.31	1.8553	3 42 54.9	11.131
24	10 34 22.58	1.8538	N. 3 31 46.8	11.140

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	10 34 22.58	1.8538	N. 3 31 46.8	11.140
1	10 36 13.76	1.8523	3 20 38.1	11.148
2	10 38 4.85	1.8508	3 9 29.0	11.156
3	10 39 55.85	1.8493	2 58 19.4	11.163
4	10 41 46.76	1.8479	2 47 9.4	11.170
5	10 43 37.60	1.8467	2 35 59.0	11.175
6	10 45 28.36	1.8453	2 24 48.4	11.180
7	10 47 19.04	1.8441	2 13 37.4	11.185
8	10 49 9.65	1.8430	2 2 26.2	11.188
9	10 51 0.20	1.8419	1 51 14.8	11.191
10	10 52 50.68	1.8408	1 40 3.2	11.193
11	10 54 41.10	1.8398	1 28 51.6	11.194
12	10 56 31.46	1.8389	1 17 39.9	11.196
13	10 58 21.77	1.8380	1 6 28.1	11.197
14	11 0 12.02	1.8371	0 55 16.3	11.196
15	11 2 2.22	1.8363	0 44 4.6	11.195
16	11 3 52.38	1.8356	0 32 52.9	11.194
17	11 5 42.49	1.8349	0 21 41.3	11.192
18	11 7 32.57	1.8343	N. 0 10 29.9	11.188
19	11 9 22.61	1.8338	S. 0 0 41.3	11.186
20	11 11 12.62	1.8332	0 11 52.4	11.182
21	11 13 2.59	1.8327	0 23 3.1	11.176
22	11 14 52.54	1.8323	0 34 13.5	11.171
23	11 16 42.47	1.8319	S. 0 45 23.6	11.165

MONDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	11 18 32.37	1.8316	S. 0 56 33.3	11.158
1	11 20 22.26	1.8313	1 7 42.6	11.151
2	11 22 12.13	1.8311	1 18 51.4	11.143
3	11 24 1.99	1.8309	1 29 59.8	11.136
4	11 25 51.84	1.8308	1 41 7.7	11.127
5	11 27 41.69	1.8308	1 52 15.0	11.117
6	11 29 31.54	1.8308	2 3 21.7	11.107
7	11 31 21.39	1.8309	2 14 27.8	11.096
8	11 33 11.25	1.8310	2 25 33.2	11.084
9	11 35 1.11	1.8312	2 36 37.9	11.072
10	11 36 50.99	1.8314	2 47 41.8	11.059
11	11 38 40.88	1.8317	2 58 45.0	11.047
12	11 40 30.79	1.8320	3 9 47.4	11.033
13	11 42 20.72	1.8323	3 20 48.9	11.018
14	11 44 10.67	1.8328	3 31 49.6	11.003
15	11 46 0.66	1.8333	3 42 49.3	10.988
16	11 47 50.67	1.8338	3 53 48.1	10.972
17	11 49 40.72	1.8344	4 4 45.9	10.954
18	11 51 30.80	1.8351	4 15 42.6	10.937
19	11 53 20.93	1.8358	4 26 38.3	10.919
20	11 55 11.10	1.8366	4 37 32.9	10.901
21	11 57 1.32	1.8374	4 48 26.4	10.882
22	11 58 51.59	1.8383	4 59 18.7	10.862
23	12 0 41.91	1.8392	5 10 9.8	10.841
24	12 2 32.29	1.8402	S. 5 20 59.6	10.820

TUESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	12 2 32.29	1.8402	S. 5 20 59.6	10.820
1	12 4 22.73	1.8412	5 31 48.2	10.798
2	12 6 13.23	1.8423	5 42 35.4	10.776
3	12 8 3.80	1.8433	5 53 21.3	10.753
4	12 9 54.43	1.8445	6 4 5.8	10.730
5	12 11 45.14	1.8458	6 14 48.9	10.706
6	12 13 35.93	1.8471	6 25 30.5	10.682
7	12 15 26.79	1.8484	6 36 10.7	10.657
8	12 17 17.74	1.8499	6 46 49.3	10.630
9	12 19 8.78	1.8513	6 57 26.3	10.603
10	12 20 59.90	1.8528	7 8 1.7	10.577
11	12 22 51.11	1.8543	7 18 35.5	10.549
12	12 24 42.42	1.8560	7 29 7.6	10.521
13	12 26 33.83	1.8577	7 39 38.0	10.492
14	12 28 25.34	1.8593	7 50 6.6	10.463
15	12 30 16.95	1.8611	8 0 33.5	10.433
16	12 32 8.67	1.8629	8 10 58.6	10.403
17	12 34 0.50	1.8648	8 21 21.8	10.371
18	12 35 52.45	1.8668	8 31 43.1	10.339
19	12 37 44.51	1.8687	8 42 2.5	10.307
20	12 39 36.69	1.8707	8 52 19.9	10.273
21	12 41 28.99	1.8728	9 2 35.3	10.239
22	12 43 21.42	1.8749	9 12 48.6	10.205
23	12 45 13.98	1.8771	S. 9 22 59.9	10.170

WEDNESDAY, AUGUST 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	12 47 6.67	1.8793	S. 9 33 9.0	10.134

PHASES OF THE MOON.

			d	h	m
☽	First Quarter . . .	July	4	12	13.6
○	Full Moon		12	1	21.9
☾	Last Quarter		18	17	31.4
●	New Moon		26	1	42.9

			d	h
☾	Apogee	July	3	3.4
☾	Perigee		15	1.6
☾	Apogee		30	20.7

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	SUN	W.	51 40 32	3366	53 3 27	3373	54 26 14	3380	55 48 53	3387
	Spica	E.	51 47 16	3006	50 17 11	3013	48 47 14	3020	47 17 26	3027
	JUPITER	E.	91 34 3	2976	90 3 20	2982	88 32 45	2989	87 2 18	2996
	SATURN	E.	120 29 29	2977	118 58 47	2984	117 28 13	2991	115 57 49	2997
2	SUN	W.	62 40 16	3416	64 2 14	3421	65 24 7	3425	66 45 55	3429
	Spica	E.	39 50 23	3056	38 21 19	3060	36 52 20	3064	35 23 26	3068
	JUPITER	E.	79 32 1	3023	78 2 17	3027	76 32 38	3031	75 3 4	3034
	SATURN	E.	108 27 39	3024	106 57 56	3028	105 28 18	3031	103 58 44	3035
3	SUN	W.	73 34 6	3439	74 55 38	3439	76 17 10	3440	77 38 41	3439
	Regulus	W.	26 39 45	3169	28 6 31	3160	29 33 28	3153	31 0 34	3147
	Spica	E.	27 59 57	3082	26 31 25	3083	25 2 55	3084	23 34 26	3086
	JUPITER	E.	67 36 7	3045	66 6 50	3047	64 37 35	3046	63 8 19	3046
	SATURN	E.	96 31 47	3045	95 2 30	3046	93 33 14	3046	92 3 58	3045
4	SUN	W.	84 26 35	3430	85 48 18	3427	87 10 4	3423	88 31 55	3419
	Regulus	W.	38 18 1	3114	39 45 52	3108	41 13 53	3101	42 42 1	3094
	JUPITER	E.	55 41 47	3039	54 12 22	3035	52 42 53	3031	51 13 19	3027
	SATURN	E.	84 37 18	3036	83 7 50	3034	81 38 19	3030	80 8 43	3026
	α Aquilæ	E.	113 7 29	3584	111 48 37	3569	110 29 29	3556	109 10 7	3543
5	SUN	W.	95 22 35	3388	96 45 5	3381	98 7 43	3372	99 30 31	3364
	Regulus	W.	50 4 51	3057	51 33 53	3049	53 3 5	3040	54 32 28	3030
	JUPITER	E.	43 44 8	3001	42 13 57	2995	40 43 38	2988	39 13 10	2980
	SATURN	E.	72 39 15	2997	71 8 59	2990	69 38 35	2983	68 8 1	2976
	α Aquilæ	E.	102 29 43	3481	101 8 58	3469	99 48 0	3457	98 26 48	3446
6	SUN	W.	106 27 7	3314	107 51 2	3304	109 15 9	3293	110 39 29	3280
	Regulus	W.	62 2 22	2981	63 32 59	2969	65 3 50	2958	66 34 56	2946
	JUPITER	E.	31 38 18	2937	30 6 46	2927	28 35 2	2917	27 3 5	2907
	SATURN	E.	60 32 35	2930	59 0 54	2920	57 29 0	2909	55 56 53	2898
	α Aquilæ	E.	91 37 43	3392	90 15 17	3381	88 52 39	3371	87 29 49	3360
7	SUN	W.	117 44 52	3214	119 10 44	3201	120 36 52	3186	122 3 18	3171
	Regulus	W.	74 14 18	2882	75 47 0	2869	77 19 59	2855	78 53 16	2841
	Spica	W.	20 10 45	2877	21 43 33	2862	23 16 40	2847	24 50 7	2831
	SATURN	E.	48 12 31	2837	46 38 51	2824	45 4 54	2810	43 30 39	2796
	α Aquilæ	E.	80 32 47	3313	79 8 51	3305	77 44 45	3296	76 20 29	3288
	Fomalhaut	E.	107 29 41	3383	106 7 5	3361	104 44 4	3340	103 20 39	3320
8	SUN	W.	129 19 57	3095	130 48 13	3079	132 16 48	3063	133 45 43	3047
	Regulus	W.	86 44 21	2767	88 19 32	2752	89 55 3	2737	91 30 54	2721
	Spica	W.	32 42 24	2754	34 17 52	2738	35 53 41	2722	37 29 51	2706
	SATURN	E.	35 34 49	2725	33 58 42	2710	32 22 15	2694	30 45 27	2679
	α Aquilæ	E.	69 17 10	3260	67 52 12	3257	66 27 10	3254	65 2 5	3253
	Fomalhaut	E.	96 17 50	3225	94 52 11	3208	93 26 11	3190	91 59 50	3174
9	Spica	W.	45 36 4	2626	47 14 23	2610	48 53 4	2594	50 32 7	2577
	α Aquilæ	E.	57 56 52	3270	56 32 6	3280	55 7 31	3291	53 43 9	3306
	Fomalhaut	E.	84 43 27	3101	83 15 19	3088	81 46 55	3076	80 18 16	3065
	α Pegasi	E.	103 20 12	2766	101 45 0	2749	100 9 25	2731	98 33 26	2714

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	SUN	W.	57 11 24	3394	58 33 47	3400	59 56 3	3406	61 18 12	3411
	Spica	E.	45 47 47	3033	44 18 15	3039	42 48 51	3045	41 19 34	3050
	JUPITER	E.	85 32 0	3002	84 1 50	3008	82 31 47	3013	81 1 51	3018
	SATURN	E.	114 27 33	3003	112 57 24	3009	111 27 23	3014	109 57 28	3019
2	SUN	W.	68 7 39	3431	69 29 20	3434	70 50 58	3436	72 12 33	3438
	Spica	E.	33 54 37	3071	32 25 52	3074	30 57 11	3076	29 28 32	3079
	JUPITER	E.	73 33 34	3038	72 4 8	3041	70 34 46	3043	69 5 26	3044
	SATURN	E.	102 29 15	3039	100 59 50	3040	99 30 27	3042	98 1 6	3043
3	SUN	W.	79 0 13	3438	80 21 46	3436	81 43 20	3433	83 4 56	3430
	Regulus	W.	32 27 47	3139	33 55 9	3133	35 22 39	3127	36 50 16	3120
	Spica	E.	22 5 59	3087	20 37 34	3088	19 9 10	3090	17 40 48	3090
	JUPITER	E.	61 39 3	3046	60 9 47	3044	58 40 29	3043	57 11 9	3041
	SATURN	E.	90 34 41	3044	89 5 23	3043	87 36 4	3042	86 6 43	3040
4	SUN	W.	89 53 50	3414	91 15 51	3408	92 37 59	3402	94 0 13	3395
	Regulus	W.	44 10 18	3087	45 38 43	3081	47 7 16	3073	48 35 59	3065
	JUPITER	E.	49 43 41	3023	48 13 57	3019	46 44 8	3014	45 14 12	3007
	SATURN	E.	78 39 2	3022	77 9 16	3016	75 39 23	3010	74 9 23	3004
	a Aquilæ	E.	107 50 30	3530	106 30 39	3517	105 10 34	3505	103 50 15	3493
5	SUN	W.	100 53 29	3355	102 16 37	3346	103 39 55	3336	105 3 25	3325
	Regulus	W.	56 2 3	3022	57 31 49	3012	59 1 47	3001	60 31 58	2991
	JUPITER	E.	37 42 32	2973	36 11 45	2964	34 40 47	2955	33 9 38	2946
	SATURN	E.	66 37 18	2967	65 6 24	2959	63 35 19	2950	62 4 3	2940
	a Aquilæ	E.	97 5 24	3436	95 43 48	3424	94 21 59	3413	92 59 57	3402
6	SUN	W.	112 4 4	3268	113 28 53	3255	114 53 57	3242	116 19 17	3229
	Regulus	W.	68 6 17	2934	69 37 53	2921	71 9 45	2908	72 41 53	2895
	JUPITER	E.	25 30 55	2896	23 58 31	2885	22 25 55	2874	20 53 4	2861
	SATURN	E.	54 24 31	2886	52 51 54	2874	51 19 2	2862	49 45 55	2849
	a Aquilæ	E.	86 6 47	3351	84 43 34	3340	83 20 9	3331	81 56 33	3322
7	SUN	W.	123 30 2	3157	124 57 3	3141	126 24 23	3126	127 52 1	3111
	Regulus	W.	80 26 51	2826	82 0 45	2812	83 34 57	2797	85 9 29	2782
	Spica	W.	26 23 54	2816	27 58 1	2801	29 32 28	2785	31 7 16	2769
	SATURN	E.	41 56 6	2782	40 21 15	2769	38 46 6	2753	37 10 37	2739
	a Aquilæ	E.	74 56 4	3282	73 31 31	3276	72 6 51	3270	70 42 4	3264
	Fomalhaut	E.	101 56 51	3300	100 32 39	3281	99 8 5	3262	97 43 8	3243
8	SUN	W.	135 14 57	3031	136 44 31	3015	138 14 25	2999	139 44 39	2983
	Regulus	W.	93 7 6	2705	94 43 39	2690	96 20 32	2674	97 57 46	2658
	Spica	W.	39 6 23	2690	40 43 16	2674	42 20 30	2658	43 58 6	2642
	SATURN	E.	29 8 19	2663	27 30 50	2648	25 53 1	2633	24 14 51	2618
	a Aquilæ	E.	63 36 58	3253	62 11 52	3255	60 46 48	3258	59 21 47	3264
	Fomalhaut	E.	90 33 10	3158	89 6 11	3143	87 38 54	3129	86 11 19	3114
9	Spica	W.	52 11 33	2562	53 51 20	2546	55 31 29	2530	57 12 0	2515
	a Aquilæ	E.	52 19 5	3325	50 55 22	3345	49 32 3	3371	48 9 13	3402
	Fomalhaut	E.	78 49 24	3056	77 20 20	3046	75 51 4	3038	74 21 38	3030
	a Pegasi	E.	96 57 5	2698	95 20 22	2681	93 43 16	2665	92 5 49	2649

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	Spica	W.	58 52 53	2499	60 34 8	2485	62 15 43	2469	63 57 40	2453
	JUPITER	W.	19 43 57	2492	21 25 21	2475	23 7 9	2458	24 49 21	2442
	α Aquilæ	E.	46 46 59	3438	45 25 25	3480	44 4 38	3528	42 44 45	3584
	Fomalhaut	E.	72 52 3	3025	71 22 21	3020	69 52 33	3017	68 22 41	3015
	α Pegasi	E.	90 28 0	2634	88 49 51	2618	87 11 21	2604	85 22 31	2590
11	Spica	W.	72 32 38	2382	74 16 38	2369	76 0 57	2356	77 45 35	2343
	JUPITER	W.	33 25 49	2368	35 10 9	2355	36 54 48	2342	38 39 46	2329
	Fomalhaut	E.	60 53 32	3034	59 24 1	3045	57 54 44	3058	56 25 43	3073
	α Pegasi	E.	77 13 42	2526	75 33 5	2515	73 52 13	2504	72 11 6	2494
	α Arietis	E.	120 23 51	2423	118 40 49	2409	116 57 27	2394	115 13 44	2380
12	Spica	W.	86 33 12	2286	88 19 32	2275	90 6 8	2265	91 52 59	2256
	JUPITER	W.	47 29 7	2271	49 15 49	2261	51 2 46	2251	52 49 58	2241
	SATURN	W.	18 36 24	2267	20 23 12	2256	22 10 17	2245	23 57 37	2235
	Fomalhaut	E.	49 7 7	3217	47 41 18	3261	46 16 21	3312	44 52 23	3372
	α Pegasi	E.	63 42 29	2459	62 0 18	2454	60 18 0	2450	58 35 37	2448
	α Arietis	E.	106 30 26	2319	104 44 54	2308	102 59 6	2298	101 13 3	2287
13	JUPITER	W.	61 49 16	2201	63 37 42	2195	65 26 17	2189	67 15 2	2183
	SATURN	W.	32 57 39	2194	34 46 15	2188	36 35 0	2182	38 23 55	2176
	Fomalhaut	E.	38 12 53	3827	36 58 21	3967	35 46 9	4128	34 36 34	4315
	α Pegasi	E.	50 3 39	2460	48 21 29	2468	46 39 31	2477	44 57 45	2489
	α Arietis	E.	92 19 24	2246	90 32 5	2240	88 44 37	2234	86 57 0	2228
	MARS	E.	128 1 29	2426	126 18 32	2419	124 35 24	2412	122 52 7	2406
14	JUPITER	W.	76 20 36	2163	78 10 0	2161	79 59 27	2159	81 48 57	2157
	Antares	W.	69 51 36	2188	71 40 21	2186	73 29 10	2183	75 18 3	2181
	SATURN	W.	47 30 22	2155	49 19 57	2153	51 9 35	2151	52 59 17	2149
	α Arietis	E.	77 57 7	2209	76 8 53	2207	74 20 36	2206	72 32 17	2204
	MARS	E.	114 13 51	2385	112 29 55	2382	110 45 55	2380	109 1 51	2378
15	JUPITER	W.	90 56 50	2156	92 46 24	2157	94 35 56	2159	96 25 26	2161
	Antares	W.	84 22 54	2179	86 11 53	2180	88 0 50	2182	89 49 45	2184
	SATURN	W.	62 8 9	2148	63 57 55	2149	65 47 39	2151	67 37 21	2152
	α Aquilæ	W.	38 40 47	3483	40 1 30	3386	41 24 2	3302	42 48 11	3227
	α Arietis	E.	63 30 37	2209	61 42 23	2211	59 54 12	2214	58 6 6	2218
	MARS	E.	100 21 9	2376	98 37 1	2377	96 52 54	2379	95 8 49	2381
16	JUPITER	W.	105 31 57	2176	107 21 0	2182	109 9 55	2186	110 58 44	2190
	Antares	W.	98 53 22	2200	100 41 50	2204	102 30 12	2208	104 18 27	2213
	SATURN	W.	76 44 57	2168	78 34 13	2172	80 23 22	2176	82 12 25	2181
	α Aquilæ	W.	50 7 48	2972	51 38 36	2938	53 10 7	2907	54 42 17	2880
	MARS	E.	86 29 21	2397	84 45 42	2402	83 2 10	2406	81 18 44	2411
	SUN	E.	126 21 44	2493	124 40 21	2497	122 59 4	2502	121 17 54	2507
17	SATURN	W.	91 15 42	2210	93 3 55	2216	94 51 58	2223	96 39 52	2229
	α Aquilæ	W.	62 30 17	2793	64 4 54	2782	65 39 46	2773	67 14 49	2766
	Fomalhaut	W.	38 26 37	3696	39 43 28	3596	41 2 7	3506	42 22 25	3427
	MARS	E.	72 43 31	2441	71 0 55	2448	69 18 28	2455	67 36 11	2462
	VENUS	E.	99 34 15	2097	97 43 11	2104	95 52 18	2112	94 1 37	2120
	SUN	E.	112 53 54	2536	111 13 31	2543	109 33 18	2550	107 53 14	2557

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	Spica	W.	65 39 59	2439	67 22 38	2424	69 5 38	2410	70 48 58	2396
	Jupiter	W.	26 31 56	2427	28 14 52	2412	29 58 10	2397	31 41 49	2382
	α Aquilæ	E.	41 25 53	3651	40 8 14	3726	38 51 54	3817	37 37 9	3917
	Fomalhaut	E.	66 52 47	3015	65 22 53	3017	63 53 1	3020	62 23 13	3026
	α Pegasi	E.	83 53 22	2576	82 13 54	2563	80 34 8	2550	78 54 3	2538
11	Spica	W.	79 30 32	2331	81 15 46	2319	83 1 18	2307	84 47 7	2296
	Jupiter	W.	40 25 3	2317	42 10 38	2304	43 56 31	2293	45 42 41	2282
	Fomalhaut	E.	54 57 1	3094	53 28 44	3118	52 0 56	3146	50 33 42	3178
	α Pegasi	E.	70 29 45	2486	68 48 12	2478	67 6 28	2470	65 24 33	2464
	α Arietis	E.	113 29 41	2368	111 45 20	2355	110 0 40	2342	108 15 42	2330
12	Spica	W.	93 40 4	2247	95 27 22	2238	97 14 53	2230	99 2 36	2223
	Jupiter	W.	54 37 25	2233	56 25 4	2224	58 12 56	2216	60 1 0	2208
	Saturn	W.	25 45 12	2227	27 33 0	2218	29 21 1	2210	31 9 14	2202
	Fomalhaut	E.	43 29 34	3438	42 8 1	3517	40 47 56	3607	39 29 29	3710
	α Pegasi	E.	56 53 11	2448	55 10 44	2449	53 28 19	2451	51 45 57	2454
	α Arietis	E.	99 26 45	2278	97 40 13	2270	95 53 29	2261	94 6 32	2253
13	Jupiter	W.	69 3 55	2178	70 52 56	2174	72 42 3	2170	74 31 17	2166
	Saturn	W.	40 12 58	2171	42 2 9	2167	43 51 27	2163	45 40 52	2159
	Fomalhaut	E.	33 29 55	4528	32 26 28	4783	31 26 38	5086	30 30 50	5445
	α Pegasi	E.	43 16 17	2505	41 35 11	2525	39 54 32	2548	38 14 23	2574
	α Arietis	E.	85 9 14	2223	83 21 21	2219	81 33 22	2215	79 45 17	2212
	Mars	E.	121 8 41	2401	119 25 8	2397	117 41 29	2392	115 57 43	2388
14	Jupiter	W.	83 38 30	2156	85 28 4	2155	87 17 39	2155	89 7 14	2155
	Antares	W.	77 6 59	2180	78 55 57	2180	80 44 55	2179	82 33 54	2178
	Saturn	W.	54 49 1	2148	56 38 47	2147	58 28 34	2147	60 18 22	2147
	α Arietis	E.	70 43 56	2204	68 55 35	2204	67 7 14	2204	65 18 54	2205
	Mars	E.	107 17 45	2377	105 33 37	2376	103 49 29	2375	102 5 19	2375
15	Jupiter	W.	98 14 53	2163	100 4 16	2166	101 53 34	2169	103 42 48	2172
	Antares	W.	91 38 37	2186	93 27 25	2189	95 16 9	2192	97 4 48	2196
	Saturn	W.	69 27 1	2155	71 16 37	2158	73 6 8	2161	74 55 35	2164
	α Aquilæ	W.	44 13 48	3163	45 40 42	3106	47 8 44	3056	48 37 48	3010
	α Arietis	E.	56 18 6	2223	54 30 12	2228	52 42 26	2233	50 54 48	2239
	Mars	E.	93 24 47	2384	91 40 49	2387	89 56 55	2390	88 13 5	2394
16	Jupiter	W.	112 47 26	2196	114 35 59	2202	116 24 23	2208	118 12 39	2213
	Antares	W.	106 6 34	2219	107 54 33	2225	109 42 23	2231	111 30 5	2238
	Saturn	W.	84 1 21	2186	85 50 9	2192	87 38 48	2198	89 27 19	2203
	α Aquilæ	W.	56 15 1	2857	57 48 15	2838	59 21 54	2820	60 55 56	2805
	Mars	E.	79 35 25	2417	77 52 14	2422	76 9 11	2428	74 26 16	2435
	Sun	E.	119 36 51	2512	117 55 55	2518	116 15 6	2524	114 34 26	2530
17	Saturn	W.	98 27 36	2237	100 15 9	2244	102 2 31	2251	103 49 42	2258
	α Aquilæ	W.	68 50 2	2760	70 25 22	2757	72 0 46	2755	73 36 14	2753
	Fomalhaut	W.	43 44 11	3360	45 7 13	3300	46 31 25	3247	47 56 38	3201
	Mars	E.	65 54 3	2469	64 12 6	2477	62 30 20	2485	60 48 45	2492
	Venus	E.	92 11 9	2128	90 20 53	2136	88 30 49	2145	86 40 58	2153
	Sun	E.	106 13 20	2565	104 33 37	2572	102 54 4	2580	101 14 42	2588

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
18	SATURN	W.	105 36 43	2266	107 23 32	2274	109 10 9	2282	110 56 35	2290
	a Aquilæ	W.	75 11 43	2753	76 47 12	2754	78 22 40	2756	79 58 5	2759
	Fomalhaut	W.	49 22 46	3161	50 49 42	3125	52 17 21	3094	53 45 38	3067
	a Pegasi	W.	27 37 27	2976	29 8 10	2910	30 40 16	2859	32 13 27	2815
	MARS	E.	59 7 20	2500	57 26 7	2508	55 45 5	2517	54 4 15	2525
	VENUS	E.	84 51 19	2162	83 1 54	2171	81 12 43	2180	79 23 46	2189
	SUN	E.	99 35 30	2596	97 56 30	2605	96 17 42	2613	94 39 5	2622
19	Fomalhaut	W.	61 14 5	2977	62 44 47	2966	64 15 42	2957	65 46 49	2949
	a Pegasi	W.	40 10 56	2686	41 47 55	2672	43 25 13	2660	45 2 46	2653
	MARS	E.	45 43 2	2569	44 3 24	2577	42 23 58	2586	40 44 45	2595
	VENUS	E.	70 22 30	2237	68 34 58	2247	66 47 41	2257	65 0 39	2267
	SUN	E.	86 29 0	2667	84 51 36	2676	83 14 24	2686	81 37 25	2695
20	Fomalhaut	W.	73 24 7	2934	74 55 43	2935	76 27 18	2937	77 58 52	2939
	a Pegasi	W.	53 12 34	2634	54 50 43	2634	56 28 52	2635	58 7 0	2635
	MARS	E.	32 31 43	2642	30 53 45	2651	29 15 59	2660	27 38 25	2669
	VENUS	E.	56 9 12	2319	54 23 40	2330	52 38 24	2340	50 53 23	2351
	SUN	E.	73 35 37	2743	71 59 54	2752	70 24 23	2762	68 49 5	2772
21	Fomalhaut	W.	85 35 31	2963	87 6 30	2971	88 37 19	2978	90 7 59	2987
	a Pegasi	W.	66 16 53	2653	67 54 36	2658	69 32 12	2663	71 9 41	2669
	VENUS	E.	42 12 17	2407	40 28 52	2419	38 45 44	2431	37 2 53	2443
	SUN	E.	60 55 49	2821	59 21 49	2831	57 48 1	2841	56 14 27	2851
22	Fomalhaut	W.	97 38 15	3043	99 7 35	3056	100 36 39	3069	102 5 26	3084
	a Pegasi	W.	79 15 3	2702	80 51 40	2710	82 28 7	2717	84 4 24	2725
	SUN	E.	48 29 50	2902	46 57 34	2913	45 25 32	2924	43 53 43	2935
23	*a* Pegasi	W.	92 3 3	2769	93 38 12	2779	95 13 8	2788	96 47 52	2797
	SUN	E.	36 18 8	2991	34 47 44	3003	33 17 36	3016	31 47 43	3029
24	*a* Pegasi	W.	104 38 15	2851	106 11 37	2862	107 44 45	2873	109 17 38	2885
	SUN	E.	24 22 27	3101	22 54 19	3124	21 26 38	3148	19 59 26	3176
28	SUN	W.	22 25 40	3407	23 47 49	3406	25 9 59	3408	26 32 6	3409
	Spica	E.	55 35 58	2977	54 5 17	2985	52 34 45	2992	51 4 22	2999
	JUPITER	E.	94 14 36	2976	92 43 53	2983	91 13 19	2990	89 42 54	2997
29	SUN	W.	33 22 0	3426	34 43 47	3429	36 5 31	3433	37 27 10	3437
	Spica	E.	43 34 33	3030	42 4 58	3036	40 35 31	3042	39 6 10	3047
	JUPITER	E.	82 12 52	3029	80 43 15	3034	79 13 45	3039	77 44 21	3045
	SATURN	E.	110 29 30	3009	108 59 28	3015	107 29 34	3020	105 59 46	3024
30	SUN	W.	44 14 29	3453	45 35 46	3455	46 57 1	3457	48 18 13	3459
	JUPITER	E.	70 18 50	3065	68 49 58	3069	67 21 11	3072	65 52 27	3075
	SATURN	E.	98 32 7	3045	97 2 50	3048	95 33 37	3051	94 4 28	3053
31	SUN	W.	55 3 50	3463	56 24 55	3463	57 46 0	3463	59 7 6	3462
	JUPITER	E.	58 29 30	3083	57 0 59	3084	55 32 30	3083	54 4 0	3082
	SATURN	E.	86 39 16	3061	85 10 19	3062	83 41 23	3062	82 12 26	3062
	a Aquilæ	E.	116 18 55	3631	115 0 54	3618	113 42 39	3606	112 24 11	3594

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
18	SATURN	W.	112 42 49	2298	114 28 51	2307	116 14 41	2315	118 0 19	2323
	a Aquilæ	W.	81 33 27	2763	83 8 43	2768	84 43 53	2774	86 18 56	2781
	Fomalhaut	W.	55 14 28	3043	56 43 47	3023	58 13 32	3005	59 43 39	2989
	a Pegasi	W.	33 47 36	2778	35 22 33	2747	36 58 11	2723	38 34 20	2703
	MARS	E.	52 23 36	2534	50 43 10	2542	49 2 55	2551	47 22 53	2559
	VENUS	E.	77 35 2	2199	75 46 33	2208	73 58 18	2218	72 10 17	2227
	SUN	E.	93 0 40	2631	91 22 27	2640	89 44 26	2649	88 6 37	2657
19	Fomalhaut	W.	67 18 6	2943	68 49 30	2939	70 20 59	2936	71 52 32	2935
	a Pegasi	W.	46 40 29	2646	48 18 22	2641	49 56 22	2638	51 34 26	2635
	MARS	E.	39 5 43	2604	37 26 54	2614	35 48 18	2623	34 9 54	2632
	VENUS	E.	63 13 51	2278	61 27 19	2287	59 41 2	2297	57 55 0	2308
	SUN	E.	80 0 38	2704	78 24 4	2713	76 47 42	2723	75 11 33	2733
20	Fomalhaut	W.	79 30 22	2942	81 1 48	2946	82 33 9	2951	84 4 24	2957
	a Pegasi	W.	59 45 7	2638	61 23 10	2641	63 1 9	2644	64 39 4	2649
	MARS	E.	26 1 3	2679	24 23 55	2688	22 46 59	2698	21 10 16	2707
	VENUS	E.	49 8 38	2362	47 24 9	2373	45 39 56	2384	43 55 59	2395
	SUN	E.	67 14 0	2782	65 39 8	2791	64 4 28	2801	62 30 2	2811
21	Fomalhaut	W.	91 38 28	2997	93 8 44	3007	94 38 48	3018	96 8 39	3030
	a Pegasi	W.	72 47 2	2675	74 24 15	2681	76 1 20	2688	77 38 16	2695
	VENUS	E.	35 20 19	2455	33 38 3	2468	31 56 5	2481	30 14 25	2496
	SUN	E.	54 41 5	2861	53 7 56	2872	51 35 1	2882	50 2 19	2892
22	Fomalhaut	W.	103 33 55	3100	105 2 5	3115	106 29 56	3134	107 57 24	3155
	a Pegasi	W.	85 40 31	2734	87 16 26	2742	88 52 10	2751	90 27 42	2760
	SUN	E.	42 22 8	2945	40 50 46	2957	39 19 39	2968	37 48 46	2980
23	a Pegasi	W.	98 22 24	2808	99 56 42	2818	101 30 47	2828	103 4 38	2839
	SUN	E.	30 18 6	3043	28 48 46	3056	27 19 43	3069	25 50 56	3084
24	a Pegasi	W.	110 50 15	2898	112 22 37	2911	113 54 41	2924	115 26 29	2937
	SUN	E.	18 32 48	3204	17 6 44	3234	15 41 16	3265	14 16 22	3298
28	SUN	W.	27 54 12	3410	29 16 17	3415	30 38 16	3420	32 0 10	3425
	Spica	E.	49 34 8	3005	48 4 2	3012	46 34 5	3018	45 4 15	3025
	JUPITER	E.	88 12 37	3004	86 42 29	3010	85 12 29	3016	83 42 37	3022
29	SUN	W.	38 48 45	3440	40 10 16	3443	41 31 44	3446	42 53 8	3449
	Spica	E.	37 36 56	3052	36 7 48	3057	34 38 46	3061	33 9 49	3065
	JUPITER	E.	76 15 4	3050	74 45 53	3054	73 16 47	3058	71 47 46	3062
	SATURN	E.	104 30 3	3029	103 0 26	3034	101 30 55	3038	100 1 29	3041
30	SUN	W.	49 39 23	3461	51 0 31	3462	52 21 38	3463	53 42 44	3463
	JUPITER	E.	64 23 47	3078	62 55 10	3079	61 26 35	3081	59 58 2	3082
	SATURN	E.	92 35 21	3056	91 6 17	3057	89 37 15	3059	88 8 15	3060
31	SUN	W.	60 28 13	3461	61 49 21	3458	63 10 32	3456	64 31 45	3453
	JUPITER	E.	52 35 29	3082	51 6 58	3081	49 38 25	3079	48 9 50	3078
	SATURN	E.	80 43 29	3060	79 14 30	3058	77 45 30	3056	76 16 27	3054
	a Aquilæ	E.	111 5 30	3583	109 46 37	3572	108 27 32	3562	107 8 16	3552

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	8 44 42.29	9.716	N.18 4 57.3	−37.61	15 46.79	66.57	6 8.11	0.140
Thur.	2	8 48 35.16	9.690	17 49 45.8	38.34	15 46.92	66.49	6 4.43	0.166
Frid.	3	8 52 27.41	9.664	17 34 17.1	39.05	15 47.05	66.40	6 0.13	0.191
Sat.	4	8 56 19.03	9.638	17 18 31.3	−39.75	15 47.18	66.32	5 55.21	0.217
SUN.	5	9 0 10.03	9.613	17 2 28.7	40.45	15 47.32	66.23	5 49.68	0.243
Mon.	6	9 4 0.42	9.587	16 46 9.6	41.13	15 47.46	66.14	5 43.53	0.269
Tues.	7	9 7 50.20	9.562	16 29 34.4	−41.80	15 47.60	66.05	5 36.77	0.294
Wed.	8	9 11 39.38	9.537	16 12 43.2	42.46	15 47.75	65.97	5 29.40	0.319
Thur.	9	9 15 27.96	9.513	15 55 36.5	43.10	15 47.90	65.88	5 21.44	0.344
Frid.	10	9 19 15.95	9.489	15 38 14.4	−43.73	15 48.06	65.80	5 12.90	0.368
Sat.	11	9 23 3.36	9.465	15 20 37.3	44.35	15 48.22	65.72	5 3.78	0.392
SUN.	12	9 26 50.20	9.442	15 2 45.4	44.96	15 48.39	65.64	4 54.10	0.415
Mon.	13	9 30 36.49	9.419	14 44 39.2	−45.56	15 48.56	65.56	4 43.88	0.438
Tues.	14	9 34 22.25	9.397	14 26 18.5	46.15	15 48.73	65.48	4 33.11	0.460
Wed.	15	9 38 7.48	9.375	14 7 44.1	46.72	15 48.90	65.40	4 21.82	0.482
Thur.	16	9 41 52.20	9.354	13 48 56.1	−47.28	15 49.08	65.33	4 10.01	0.503
Frid.	17	9 45 36.41	9.333	13 29 54.7	47.83	15 49.26	65.25	3 57.70	0.524
Sat.	18	9 49 20.13	9.313	13 10 40.4	48.36	15 49.45	65.18	3 44.90	0.544
SUN.	19	9 53 3.36	9.293	12 51 13.5	−48.88	15 49.64	65.11	3 31.61	0.564
Mon.	20	9 56 46.12	9.273	12 31 34.3	49.38	15 49.83	65.04	3 17.86	0.583
Tues.	21	10 0 28.41	9.254	12 11 43.1	49.88	15 50.02	64.97	3 3.64	0.602
Wed.	22	10 4 10.26	9.235	11 51 40.2	−50.36	15 50.22	64.90	2 48.97	0.620
Thur.	23	10 7 51.66	9.217	11 31 26.0	50.83	15 50.42	64.83	2 33.86	0.638
Frid.	24	10 11 32.63	9.199	11 11 0.8	51.28	15 50.63	64.77	2 18.32	0.656
Sat.	25	10 15 13.17	9.182	10 50 25.0	−51.72	15 50.84	64.71	2 2.35	0.674
SUN.	26	10 18 53.30	9.165	10 29 38.9	52.14	15 51.05	64.65	1 45.97	0.691
Mon.	27	10 22 33.04	9.149	10 8 43.0	52.55	15 51.26	64.59	1 29.19	0.707
Tues.	28	10 26 12.38	9.133	9 47 37.3	−52.94	15 51.48	64.53	1 12.03	0.723
Wed.	29	10 29 51.35	9.118	9 26 22.4	53.32	15 51.70	64.48	0 54.49	0.738
Thur.	30	10 33 29.96	9.104	9 4 58.6	53.69	15 51.92	64.43	0 36.59	0.753
Frid.	31	10 37 8.21	9.090	8 43 26.0	54.04	15 52.14	64.38	0 18.34	0.767
Sat.	32	10 40 46.13	9.076	N. 8 21 45.2	−54.38	15 52.37	64.33	0 0.22	0.781

NOTE.—The mean time of semidiameter passing may be found by subtracting 0ˢ.18 from the sidereal time.

The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Equation of Time, to be Subtracted from Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	8 44 41.30	9.716	N.18 5 1.1	−37.61	6 8.12	0.140	8 38 33.18
Thur.	2	8 48 34.18	9.690	17 49 49.7	38.34	6 4.44	0.166	8 42 29.74
Frid.	3	8 52 26.44	9.664	17 34 21.0	39.05	6 0.15	0.191	8 46 26.29
Sat.	4	8 56 18.08	9.638	17 18 35.2	−39.75	5 55.23	0.217	8 50 22.85
SUN.	5	9 0 9.10	9.613	17 2 32.6	40.45	5 49.70	0.243	8 54 19.40
Mon.	6	9 3 59.51	9.587	16 46 13.5	41.13	5 43.55	0.269	8 58 15.96
Tues.	7	9 7 49.31	9.562	16 29 38.3	−41.80	5 36.80	0.294	9 2 12.51
Wed.	8	9 11 38.51	9.537	16 12 47.1	42.46	5 29.44	0.319	9 6 9.97
Thur.	9	9 15 27.11	9.513	15 55 40.3	43.10	5 21.48	0.344	9 10 5.62
Frid.	10	9 19 15.12	9.489	15 38 18.2	−43.73	5 12.94	0.368	9 14 2.18
Sat.	11	9 23 2.56	9.465	15 20 41.0	44.35	5 3.82	0.392	9 17 58.73
SUN.	12	9 26 49.43	9.442	15 2 49.1	44.96	4 54.14	0.415	9 21 55.29
Mon.	13	9 30 35.75	9.419	14 44 42.7	−45.56	4 43.91	0.438	9 25 51.84
Tues.	14	9 34 21.54	9.397	14 26 22.0	46.15	4 33.14	0.460	9 29 48.40
Wed.	15	9 38 6.80	9.375	14 7 47.5	46.72	4 21.85	0.482	9 33 44.95
Thur.	16	9 41 51.55	9.354	13 48 59.4	−47.28	4 10.04	0.503	9 37 41.50
Frid.	17	9 45 35.79	9.333	13 29 57.9	47.83	3 57.73	0.524	9 41 38.06
Sat.	18	9 49 19.54	9.313	13 10 43.5	48.36	3 44.93	0.544	9 45 34.61
SUN.	19	9 53 2.81	9.293	12 51 16.4	−48.88	3 31.64	0.564	9 49 31.17
Mon.	20	9 56 45.61	9.273	12 31 37.0	49.38	3 17.89	0.583	9 53 27.72
Tues.	21	10 0 27.94	9.254	12 11 45.6	49.88	3 3.67	0.602	9 57 24.28
Wed.	22	10 4 9.83	9.235	11 51 42.6	−50.36	2 49.00	0.620	10 1 20.83
Thur.	23	10 7 51.27	9.217	11 31 28.2	50.83	2 33.89	0.638	10 5 17.38
Frid.	24	10 11 32.28	9.199	11 11 2.8	51.28	2 18.34	0.656	10 9 13.94
Sat.	25	10 15 12.86	9.182	10 50 26.8	−51.72	2 2.37	0.674	10 13 10.49
SUN.	26	10 18 53.03	9.165	10 29 40.5	52.14	1 45.99	0.691	10 17 7.04
Mon.	27	10 22 32.81	9.149	10 8 44.3	52.55	1 29.21	0.707	10 21 3.60
Tues.	28	10 26 12.19	9.133	9 47 38.4	−52.94	1 12.04	0.723	10 25 0.15
Wed.	29	10 29 51.20	9.118	9 26 23.2	53.32	0 54.50	0.738	10 28 56.70
Thur.	30	10 33 29.86	9.104	9 4 59.1	53.69	0 36.60	0.753	10 32 53.26
Frid.	31	10 37 8.16	9.090	8 43 26.3	54.04	0 18.35	0.767	10 36 49.81
Sat.	32	10 40 46.13	9.076	N. 8 21 45.2	−54.38	0 0.23	0.781	10 40 46.36

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour, $+9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	213	128 44 48.7	44 2.2	143.56	− 0.55	0.0063959	−24.8	15 18 55.86
2	214	129 42 14.5	41 27.8	143.59	0.46	0.0063353	25.6	15 14 59.95
3	215	130 39 41.0	38 54.2	143.62	0.38	0.0062728	26.4	15 11 4.04
4	216	131 37 8.1	36 21.2	143.65	− 0.26	0.0062085	−27.2	15 7 8.13
5	217	132 34 36.0	33 49.0	143.68	0.14	0.0061424	27.9	15 3 12.22
6	218	133 32 4.7	31 17.5	143.71	− 0.01	0.0060748	28.5	14 59 16.31
7	219	134 29 34.1	28 46.8	143.74	+ 0.12	0.0060058	−29.1	14 55 20.40
8	220	135 27 4.4	26 17.0	143.78	0.23	0.0059353	29.6	14 51 24.50
9	221	136 24 35.7	23 48.1	143.82	0.33	0.0058638	30.1	14 47 28.59
10	222	137 22 8.0	21 20.3	143.87	+ 0.40	0.0057911	−30.6	14 43 32.68
11	223	138 19 41.4	18 53.5	143.92	0.43	0.0057175	31.0	14 39 36.77
12	224	139 17 16.0	16 28.0	143.97	0.44	0.0056428	31.4	14 35 40.86
13	225	140 14 52.0	14 3.9	144.03	+ 0.42	0.0055670	−31.8	14 31 44.95
14	226	141 12 29.4	11 41.2	144.09	0.37	0.0054903	32.3	14 27 49.04
15	227	142 10 8.3	9 20.0	144.16	0.29	0.0054123	32.7	14 23 53.14
16	228	143 7 48.8	7 0.3	144.22	+ 0.18	0.0053331	−33.3	14 19 57.23
17	229	144 5 30.9	4 42.3	144.29	+ 0.06	0.0052525	34.0	14 16 1.32
18	230	145 3 14.7	2 26.0	144.35	− 0.07	0.0051702	34.7	14 12 5.41
19	231	146 1 0.1	0 11.3	144.42	− 0.20	0.0050864	−35.4	14 8 9.50
20	232	146 58 47.2	57 58.3	144.49	0.33	0.0050008	36.1	14 4 13.59
21	233	147 56 35.9	55 46.9	144.56	0.44	0.0049133	36.8	14 0 17.69
22	234	148 54 26.3	53 37.1	144.63	− 0.54	0.0048240	−37.6	13 56 21.78
23	235	149 52 18.2	51 29.0	144.70	0.61	0.0047328	38.4	13 52 25.87
24	236	150 50 11.8	49 22.4	144.77	0.66	0.0046396	39.2	13 48 29.96
25	237	151 48 6.8	47 17.4	144.83	− 0.67	0.0045445	−40.0	13 44 34.06
26	238	152 46 3.4	45 13.9	144.89	0.68	0.0044475	40.8	13 40 38.15
27	239	153 44 1.5	43 11.8	144.95	0.64	0.0043487	41.6	13 36 42.24
28	240	154 42 1.0	41 11.2	145.01	− 0.60	0.0042481	−42.3	13 32 46.33
29	241	155 40 2.0	39 12.1	145.07	0.52	0.0041458	42.9	13 28 50.42
30	242	156 38 4.4	37 14.4	145.13	0.41	0.0040419	43.4	13 24 54.51
31	243	157 36 8.3	35 18.2	145.19	0.31	0.0039365	43.9	13 20 58.61
32	244	158 34 13.5	33 23.3	145.25	− 0.18	0.0038298	−44.4	13 17 2.70

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 47.8	14 49.6	54 11.5	+0.44	54 18.0	+0.64	4 15.9	1.78	5.9
2	14 52.0	14 55.1	54 26.9	0.85	54 38.4	1.06	4 59.4	1.86	6.9
3	14 58.9	15 3.4	54 52.3	1.25	55 8.7	1.46	5 45.2	1.96	7.9
4	15 8.5	15 14.2	55 27.5	+1.65	55 48.4	+1.83	6 33.8	2.09	8.9
5	15 20.4	15 27.1	56 11.3	1.98	56 35.9	2.10	7 25.4	2.21	9.9
6	15 34.2	15 41.5	57 1.8	2.20	57 28.7	2.25	8 19.6	2.31	10.9
7	15 48.9	15 56.3	57 56.0	+2.27	58 23.2	+2.24	9 15.8	2.36	11.9
8	16 3.6	16 10.4	58 49.8	2.15	59 15.0	2.02	10 12.7	2.37	12.9
9	16 16.8	16 22.4	59 38.3	1.83	59 59.0	1.60	11 9.4	2.34	13.9
10	16 27.2	16 31.0	60 16.6	+1.32	60 30.7	+1.01	12 5.0	2.29	14.9
11	16 33.8	16 35.5	60 40.9	+0.67	60 46.9	+0.32	12 59.5	2.25	15.9
12	16 35.9	16 35.3	60 48.6	−0.03	60 46.2	−0.36	13 53.1	2.22	16.9
13	16 33.6	16 30.9	60 39.9	−0.68	60 30.0	−0.96	14 46.5	2.23	17.9
14	16 27.3	16 23.0	60 16.8	1.20	60 1.0	1.40	15 40.2	2.25	18.9
15	16 18.1	16 12.7	59 43.1	1.57	59 23.4	1.68	16 34.7	2.29	19.9
16	16 7.1	16 1.2	59 2.6	−1.76	58 41.2	−1.80	17 30.0	2.32	20.9
17	15 55.3	15 49.4	58 19.5	1.80	57 57.8	1.79	18 25.6	2.32	21.9
18	15 43.6	15 38.0	57 36.6	1.75	57 15.9	1.69	19 20.9	2.28	22.9
19	15 32.6	15 27.4	56 56.0	−1.62	56 37.0	−1.54	20 14.7	2.20	23.9
20	15 22.5	15 17.9	56 19.0	1.46	56 1.9	1.37	21 6.5	2.10	24.9
21	15 13.5	15 9.5	55 46.0	1.28	55 31.1	1.20	21 55.6	1.99	25.9
22	15 5.7	15 2.2	55 17.2	−1.11	55 4.3	−1.03	22 42.2	1.89	26.9
23	14 59.0	14 56.0	54 52.5	0.94	54 41.7	0.85	23 26.5	1.81	27.9
24	14 53.4	14 51.0	54 32.0	0.76	54 23.4	0.67	☌		28.9
25	14 49.0	14 47.3	54 15.9	−0.58	54 9.5	−0.47	0 9.1	1.75	0.3
26	14 45.9	14 44.9	54 4.5	0.36	54 0.9	−0.24	0 50.7	1.72	1.3
27	14 44.3	14 44.2	53 58.7	−0.11	53 58.1	+0.02	1 32.0	1.72	2.3
28	14 44.4	14 45.2	53 59.1	+0.16	54 2.0	+0.32	2 13.6	1.75	3.3
29	14 46.5	14 48.4	54 6.9	0.49	54 13.8	0.66	2 56.3	1.81	4.3
30	14 50.9	14 54.0	54 22.8	0.85	54 34.1	1.03	3 40.8	1.90	5.3
31	14 57.6	15 2.0	54 47.6	1.23	55 3.5	+1.42	4 27.5	2.00	6.3
32	15 6.9	15 12.4	55 21.7	+1.60	55 42.0	+1.79	5 16.7	2.10	7.3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 1.					FRIDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 47 6.67	1.8793	S. 9 33 9.0	10.134	0	14 20 47.33	2.0403	S. 16 46 7.6	7.638
1	12 48 59.50	1.8816	9 43 16.0	10.098	1	14 22 49.88	2.0447	16 53 43.8	7.568
2	12 50 52.46	1.8839	9 53 20.8	10.062	2	14 24 52.69	2.0490	17 1 15.7	7.497
3	12 52 45.57	1.8863	10 3 23.4	10.024	3	14 26 55.76	2.0534	17 8 43.4	7.426
4	12 54 38.82	1.8888	10 13 23.7	9.986	4	14 28 59.10	2.0578	17 16 6.8	7.353
5	12 56 32.22	1.8913	10 23 21.7	9.948	5	14 31 2.70	2.0622	17 23 25.8	7.280
6	12 58 25.77	1.8938	10 33 17.4	9.908	6	14 33 6.56	2.0666	17 30 40.4	7.207
7	13 0 19.47	1.8963	10 43 10.7	9.868	7	14 35 10.69	2.0711	17 37 50.6	7.132
8	13 2 13.33	1.8990	10 53 1.6	9.828	8	14 37 15.09	2.0756	17 44 56.3	7.056
9	13 4 7.35	1.9017	11 2 50.0	9.786	9	14 39 19.76	2.0801	17 51 57.4	6.980
10	13 6 1.53	1.9043	11 12 35.9	9.744	10	14 41 24.70	2.0846	17 58 53.9	6.903
11	13 7 55.87	1.9071	11 22 19.3	9.702	11	14 43 29.91	2.0892	18 5 45.8	6.826
12	13 9 50.38	1.9100	11 32 0.2	9.658	12	14 45 35.40	2.0938	18 12 33.1	6.747
13	13 11 45.07	1.9129	11 41 38.4	9.614	13	14 47 41.16	2.0983	18 19 15.5	6.668
14	13 13 39.93	1.9158	11 51 13.9	9.570	14	14 49 47.20	2.1029	18 25 53.2	6.588
15	13 15 34.96	1.9187	12 0 46.8	9.525	15	14 51 53.51	2.1075	18 32 26.0	6.506
16	13 17 30.17	1.9218	12 10 16.9	9.478	16	14 54 0.10	2.1122	18 38 53.9	6.423
17	13 19 25.57	1.9248	12 19 44.2	9.432	17	14 56 6.97	2.1168	18 45 16.8	6.341
18	13 21 21.15	1.9279	12 29 8.7	9.385	18	14 58 14.12	2.1215	18 51 34.8	6.258
19	13 23 16.92	1.9311	12 38 30.4	9.338	19	15 0 21.55	2.1262	18 57 47.7	6.173
20	13 25 12.88	1.9343	12 47 49.2	9.288	20	15 2 29.26	2.1308	19 3 55.5	6.088
21	13 27 9.03	1.9375	12 57 5.0	9.239	21	15 4 37.25	2.1355	19 9 58.2	6.002
22	13 29 5.38	1.9408	13 6 17.9	9.189	22	15 6 45.52	2.1403	19 15 55.7	5.915
23	13 31 1.92	1.9440	S. 13 15 27.7	9.138	23	15 8 54.08	2.1450	S. 19 21 48.0	5.827
	THURSDAY 2.					SATURDAY 4.			
0	13 32 58.66	1.9474	S. 13 24 34.5	9.088	0	15 11 2.92	2.1497	S. 19 27 34.9	5.738
1	13 34 55.61	1.9509	13 33 38.2	9.035	1	15 13 12.04	2.1544	19 33 16.5	5.648
2	13 36 52.77	1.9543	13 42 38.7	8.983	2	15 15 21.45	2.1593	19 38 52.7	5.558
3	13 38 50.13	1.9578	13 51 36.1	8.929	3	15 17 31.15	2.1640	19 44 23.5	5.468
4	13 40 47.71	1.9614	14 0 30.2	8.875	4	15 19 41.13	2.1687	19 49 48.8	5.375
5	13 42 45.50	1.9650	14 9 21.1	8.820	5	15 21 51.39	2.1734	19 55 8.5	5.282
6	13 44 43.51	1.9687	14 18 8.6	8.764	6	15 24 1.94	2.1782	20 0 22.6	5.188
7	13 46 41.74	1.9723	14 26 52.8	8.708	7	15 26 12.77	2.1828	20 5 31.1	5.093
8	13 48 40.19	1.9760	14 35 33.6	8.651	8	15 28 23.88	2.1876	20 10 33.8	4.998
9	13 50 38.86	1.9798	14 44 10.9	8.593	9	15 30 35.28	2.1923	20 15 30.9	4.902
10	13 52 37.76	1.9835	14 52 44.8	8.535	10	15 32 46.96	2.1971	20 20 22.1	4.804
11	13 54 36.88	1.9873	15 1 15.1	8.475	11	15 34 58.93	2.2018	20 25 7.4	4.707
12	13 56 36.24	1.9913	15 9 41.8	8.415	12	15 37 11.18	2.2065	20 29 46.9	4.608
13	13 58 35.83	1.9952	15 18 4.9	8.355	13	15 39 23.71	2.2113	20 34 20.4	4.508
14	14 0 35.66	1.9991	15 26 24.4	8.294	14	15 41 36.53	2.2159	20 38 47.9	4.408
15	14 2 35.72	2.0030	15 34 40.2	8.232	15	15 43 49.62	2.2206	20 43 9.4	4.308
16	14 4 36.02	2.0071	15 42 52.2	8.168	16	15 46 3.00	2.2253	20 47 24.8	4.205
17	14 6 36.57	2.0112	15 51 0.4	8.104	17	15 48 16.66	2.2299	20 51 34.9	4.102
18	14 8 37.36	2.0153	15 59 4.7	8.040	18	15 50 30.59	2.2345	20 55 37.0	3.998
19	14 10 38.40	2.0193	16 7 5.2	7.975	19	15 52 44.80	2.2392	20 59 33.7	3.893
20	14 12 39.68	2.0234	16 15 1.7	7.909	20	15 54 59.29	2.2438	21 3 24.2	3.788
21	14 14 41.21	2.0277	16 22 54.3	7.843	21	15 57 14.05	2.2483	21 7 8.3	3.682
22	14 16 43.00	2.0319	16 30 42.8	7.775	22	15 59 29.09	2.2529	21 10 46.0	3.575
23	14 18 45.04	2.0361	16 38 27.3	7.707	23	16 1 44.40	2.2575	21 14 17.3	3.467
24	14 20 47.33	2.0403	S. 16 46 7.6	7.638	24	16 3 59.99	2.2621	S. 21 17 42.0	3.358

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 5.					TUESDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 3 59.99	2.2621	S.21 17 42.0	3.358	0	17 56 59.89	2.4251	S.21 40 22.7	2.630
1	16 6 15.85	2.2665	21 21 0.3	3.249	1	17 59 25.45	2.4269	21 37 40.8	2.766
2	16 8 31.97	2.2709	21 24 12.0	3.139	2	18 1 51.12	2.4287	21 34 50.8	2.901
3	16 10 48.36	2.2753	21 27 17.0	3.028	3	18 4 16.89	2.4303	21 31 52.7	3.037
4	16 13 5.01	2.2798	21 30 15.3	2.916	4	18 6 42.76	2.4320	21 28 46.4	3.173
5	16 15 21.93	2.2842	21 33 6.9	2.803	5	18 9 8.73	2.4336	21 25 31.9	3.309
6	16 17 39.11	2.2885	21 35 51.7	2.690	6	18 11 34.79	2.4351	21 22 9.3	3.445
7	16 19 56.55	2.2928	21 38 29.7	2.576	7	18 14 0.94	2.4365	21 18 38.5	3.581
8	16 22 14.25	2.2971	21 41 0.8	2.461	8	18 16 27.17	2.4378	21 14 59.6	3.717
9	16 24 32.20	2.3013	21 43 25.0	2.346	9	18 18 53.47	2.4390	21 11 12.5	3.853
10	16 26 50.40	2.3054	21 45 42.3	2.229	10	18 21 19.85	2.4402	21 7 17.2	3.989
11	16 29 8.85	2.3096	21 47 52.5	2.112	11	18 23 46.30	2.4413	21 3 13.8	4.125
12	16 31 27.55	2.3138	21 49 55.7	1.994	12	18 26 12.80	2.4423	20 59 2.2	4.262
13	16 33 46.50	2.3178	21 51 51.8	1.876	13	18 28 39.37	2.4433	20 54 42.4	4.398
14	16 36 5.69	2.3218	21 53 40.8	1.757	14	18 31 5.99	2.4441	20 50 14.5	4.533
15	16 38 25.12	2.3258	21 55 22.6	1.637	15	18 33 32.66	2.4449	20 45 38.4	4.669
16	16 40 44.79	2.3298	21 56 57.2	1.516	16	18 35 59.38	2.4457	20 40 54.2	4.805
17	16 43 4.69	2.3337	21 58 24.5	1.394	17	18 38 26.14	2.4463	20 36 1.8	4.940
18	16 45 24.83	2.3376	21 59 44.5	1.273	18	18 40 52.94	2.4469	20 31 1.4	5.075
19	16 47 45.20	2.3413	22 0 57.2	1.150	19	18 43 19.77	2.4474	20 25 52.8	5.211
20	16 50 5.79	2.3450	22 2 2.5	1.027	20	18 45 46.63	2.4478	20 20 36.1	5.345
21	16 52 26.60	2.3488	22 3 0.4	0.903	21	18 48 13.51	2.4482	20 15 11.4	5.479
22	16 54 47.64	2.3524	22 3 50.8	0.778	22	18 50 40.42	2.4486	20 9 38.6	5.613
23	16 57 8.89	2.3559	S.22 4 33.8	0.653	23	18 53 7.34	2.4488	S.20 3 57.8	5.747
	MONDAY 6.					WEDNESDAY 8.			
0	16 59 30.35	2.3595	S.22 5 9.2	0.528	0	18 55 34.27	2.4489	S.19 58 9.0	5.880
1	17 1 52.03	2.3630	22 5 37.1	0.401	1	18 58 1.21	2.4490	19 52 12.2	6.013
2	17 4 13.91	2.3663	22 5 57.3	0.273	2	19 0 28.15	2.4490	19 46 7.4	6.146
3	17 6 35.99	2.3698	22 6 9.9	0.147	3	19 2 55.09	2.4489	19 39 54.7	6.278
4	17 8 58.28	2.3731	22 6 14.9	− 0.019	4	19 5 22.02	2.4488	19 33 34.0	6.411
5	17 11 20.76	2.3763	22 6 12.2	+ 0.110	5	19 7 48.95	2.4487	19 27 5.4	6.542
6	17 13 43.43	2.3794	22 6 1.7	0.239	6	19 10 15.86	2.4484	19 20 29.0	6.672
7	17 16 6.29	2.3825	22 5 43.5	0.368	7	19 12 42.76	2.4482	19 13 44.8	6.803
8	17 18 29.33	2.3856	22 5 17.5	0.498	8	19 15 9.64	2.4478	19 6 52.7	6.933
9	17 20 52.56	2.3886	22 4 43.7	0.628	9	19 17 36.49	2.4473	18 59 52.9	7.062
10	17 23 15.96	2.3914	22 4 2.1	0.760	10	19 20 3.32	2.4469	18 52 45.3	7.191
11	17 25 39.53	2.3943	22 3 12.5	0.892	11	19 22 30.12	2.4463	18 45 30.0	7.319
12	17 28 3.28	2.3972	22 2 15.1	1.023	12	19 24 56.88	2.4457	18 38 7.0	7.447
13	17 30 27.19	2.3998	22 1 9.8	1.155	13	19 27 23.60	2.4450	18 30 36.4	7.573
14	17 32 51.26	2.4025	21 59 56.5	1.288	14	19 29 50.28	2.4443	18 22 58.3	7.698
15	17 35 15.49	2.4051	21 58 35.3	1.420	15	19 32 16.92	2.4436	18 15 12.6	7.824
16	17 37 39.87	2.4076	21 57 6.1	1.553	16	19 34 43.51	2.4427	18 7 19.4	7.949
17	17 40 4.40	2.4100	21 55 28.9	1.688	17	19 37 10.04	2.4418	17 59 18.7	8.073
18	17 42 29.07	2.4123	21 53 43.6	1.822	18	19 39 36.52	2.4408	17 51 10.6	8.196
19	17 44 53.88	2.4147	21 51 50.3	1.956	19	19 42 2.94	2.4398	17 42 55.2	8.318
20	17 47 18.83	2.4169	21 49 48.9	2.090	20	19 44 29.30	2.4388	17 34 32.5	8.439
21	17 49 43.91	2.4190	21 47 39.5	2.224	21	19 46 55.60	2.4378	17 26 2.5	8.560
22	17 52 9.11	2.4211	21 45 22.0	2.359	22	19 49 21.83	2.4366	17 17 25.3	8.680
23	17 54 34.44	2.4232	21 42 56.4	2.494	23	19 51 47.99	2.4355	17 8 40.9	8.799
24	17 56 59.89	2.4251	S.21 40 22.7	2.630	24	19 54 14.09	2.4343	S.16 59 49.4	8.917

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 9.					**SATURDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 54 14.09	2.4343	S. 16 59 49.4	8.917	0	21 49 10.60	2.3517	S. 7 57 28.7	13.165
1	19 56 40.11	2.4329	16 50 50.8	9.034	1	21 51 31.65	2.3499	7 44 17.2	13.218
2	19 59 6.04	2.4316	16 41 45.2	9.151	2	21 53 52.59	2.3483	7 31 2.5	13.270
3	20 1 31.90	2.4303	16 32 32.7	9.266	3	21 56 13.44	2.3467	7 17 44.8	13.319
4	20 3 57.68	2.4289	16 23 13.3	9.380	4	21 58 34.19	2.3451	7 4 24.2	13.368
5	20 6 23.37	2.4275	16 13 47.1	9.493	5	22 0 54.85	2.3435	6 51 0.7	13.415
6	20 8 48.98	2.4261	16 4 14.2	9.605	6	22 3 15.41	2.3419	6 37 34.4	13.460
7	20 11 14.50	2.4246	15 54 34.5	9.717	7	22 5 35.88	2.3404	6 24 5.5	13.503
8	20 13 39.93	2.4230	15 44 48.2	9.827	8	22 7 56.26	2.3389	6 10 34.1	13.544
9	20 16 5.26	2.4214	15 34 55.3	9.936	9	22 10 16.55	2.3374	5 57 0.2	13.584
10	20 18 30.50	2.4199	15 24 55.9	10.043	10	22 12 36.75	2.3360	5 43 24.0	13.622
11	20 20 55.65	2.4183	15 14 50.1	10.150	11	22 14 56.87	2.3346	5 29 45.6	13.658
12	20 23 20.70	2.4167	15 4 37.9	10.256	12	22 17 16.90	2.3332	5 16 5.0	13.694
13	20 25 45.65	2.4150	14 54 19.4	10.361	13	22 19 36.85	2.3318	5 2 22.3	13.728
14	20 28 10.50	2.4133	14 43 54.6	10.464	14	22 21 56.72	2.3305	4 48 37.7	13.759
15	20 30 35.25	2.4116	14 33 23.7	10.566	15	22 24 16.51	2.3292	4 34 51.2	13.789
16	20 32 59.89	2.4098	14 22 46.7	10.667	16	22 26 36.22	2.3279	4 21 3.0	13.817
17	20 35 24.43	2.4081	14 12 3.7	10.767	17	22 28 55.86	2.3268	4 7 13.2	13.843
18	20 37 48.86	2.4063	14 1 14.7	10.865	18	22 31 15.43	2.3256	3 53 21.8	13.869
19	20 40 13.19	2.4046	13 50 19.9	10.962	19	22 33 34.93	2.3244	3 39 28.9	13.893
20	20 42 37.41	2.4028	13 39 19.3	11.058	20	22 35 54.36	2.3233	3 25 34.7	13.914
21	20 45 1.52	2.4010	13 28 13.0	11.152	21	22 38 13.72	2.3222	3 11 39.2	13.934
22	20 47 25.53	2.3992	13 17 1.1	11.245	22	22 40 33.02	2.3211	2 57 42.6	13.952
23	20 49 49.42	2.3973	S. 13 5 43.6	11.338	23	22 42 52.25	2.3201	S. 2 43 45.0	13.968
	FRIDAY 10.					**SUNDAY 12.**			
0	20 52 13.20	2.3954	S. 12 54 20.6	11.428	0	22 45 11.43	2.3192	S. 2 29 46.4	13.983
1	20 54 36.87	2.3936	12 42 52.2	11.518	1	22 47 30.55	2.3182	2 15 47.0	13.997
2	20 57 0.43	2.3918	12 31 18.5	11.605	2	22 49 49.61	2.3173	2 1 46.8	14.008
3	20 59 23.88	2.3899	12 19 39.6	11.692	3	22 52 8.62	2.3164	1 47 45.9	14.018
4	21 1 47.22	2.3880	12 7 55.5	11.777	4	22 54 27.58	2.3156	1 33 44.5	14.027
5	21 4 10.44	2.3861	11 56 6.4	11.860	5	22 56 46.49	2.3148	1 19 42.7	14.033
6	21 6 33.55	2.3843	11 44 12.3	11.943	6	22 59 5.36	2.3141	1 5 40.5	14.038
7	21 8 56.55	2.3824	11 32 13.3	12.023	7	23 1 24.18	2.3133	0 51 38.1	14.041
8	21 11 19.44	2.3805	11 20 9.5	12.103	8	23 3 42.96	2.3127	0 37 35.6	14.043
9	21 13 42.21	2.3786	11 8 1.0	12.180	9	23 6 1.70	2.3121	0 23 33.0	14.043
10	21 16 4.87	2.3768	10 55 47.8	12.257	10	23 8 20.41	2.3115	S. 0 9 30.4	14.042
11	21 18 27.42	2.3748	10 43 30.1	12.333	11	23 10 39.08	2.3109	N. 0 4 32.0	14.038
12	21 20 49.85	2.3729	10 31 7.9	12.406	12	23 12 57.72	2.3104	0 18 34.1	14.033
13	21 23 12.17	2.3712	10 18 41.4	12.478	13	23 15 16.33	2.3099	0 32 35.9	14.026
14	21 25 34.39	2.3693	10 6 10.6	12.548	14	23 17 34.91	2.3095	0 46 37.2	14.018
15	21 27 56.49	2.3675	9 53 35.7	12.616	15	23 19 53.47	2.3092	1 0 38.0	14.008
16	21 30 18.49	2.3657	9 40 56.7	12.683	16	23 22 12.01	2.3088	1 14 38.1	13.996
17	21 32 40.37	2.3638	9 28 13.7	12.749	17	23 24 30.53	2.3085	1 28 37.5	13.983
18	21 35 2.15	2.3621	9 15 26.8	12.814	18	23 26 49.03	2.3083	1 42 36.0	13.968
19	21 37 23.82	2.3603	9 2 36.0	12.877	19	23 29 7.52	2.3081	1 56 33.6	13.952
20	21 39 45.38	2.3585	8 49 41.6	12.937	20	23 31 26.00	2.3078	2 10 30.2	13.934
21	21 42 6.84	2.3568	8 36 43.6	12.997	21	23 33 44.46	2.3077	2 24 25.7	13.914
22	21 44 28.20	2.3551	8 23 42.0	13.055	22	23 36 2.92	2.3076	2 38 19.9	13.893
23	21 46 49.45	2.3533	8 10 37.0	13.111	23	23 38 21.37	2.3075	2 52 12.8	13.870
24	21 49 10.60	2.3517	S. 7 57 28.7	13.165	24	23 40 39.82	2.3075	N. 3 6 4.3	13.846

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 13.					WEDNESDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 40 39.82	2.3075	N. 3 6 4.3	13.846	0	1 32 4.61	2.3457	N.13 14 14.7	10.969
1	23 42 58.27	2.3075	3 19 54.3	13.819	1	1 34 25.39	2.3470	13 25 10.1	10.878
2	23 45 16.72	2.3076	3 33 42.6	13.791	2	1 36 46.25	2.3484	13 36 0.0	10.786
3	23 47 35.18	2.3077	3 47 29.2	13.763	3	1 39 7.20	2.3498	13 46 44.4	10.693
4	23 49 53.64	2.3078	4 1 14.1	13.732	4	1 41 28.22	2.3510	13 57 23.1	10.598
5	23 52 12.11	2.3079	4 14 57.0	13.699	5	1 43 49.32	2.3524	14 7 56.1	10.502
6	23 54 30.59	2.3082	4 28 38.0	13.666	6	1 46 10.51	2.3538	14 18 23.3	10.405
7	23 56 49.09	2.3085	4 42 16.9	13.631	7	1 48 31.78	2.3552	14 28 44.7	10.308
8	23 59 7.61	2.3088	4 55 53.7	13.594	8	1 50 53.13	2.3565	14 39 0.3	10.210
9	0 1 26.14	2.3090	5 9 28.2	13.555	9	1 53 14.56	2.3578	14 49 9.9	10.110
10	0 3 44.69	2.3094	5 23 0.3	13.515	10	1 55 36.07	2.3593	14 59 13.5	10.009
11	0 6 3.27	2.3099	5 36 30.0	13.473	11	1 57 57.67	2.3607	15 9 11.0	9.908
12	0 8 21.88	2.3103	5 49 57.1	13.430	12	2 0 19.35	2.3620	15 19 2.5	9.806
13	0 10 40.51	2.3108	6 3 21.6	13.387	13	2 2 41.11	2.3633	15 28 47.7	9.702
14	0 12 59.17	2.3113	6 16 43.5	13.341	14	2 5 2.94	2.3646	15 38 26.7	9.598
15	0 15 17.87	2.3119	6 30 2.5	13.293	15	2 7 24.86	2.3660	15 47 59.5	9.493
16	0 17 36.60	2.3124	6 43 18.6	13.244	16	2 9 46.86	2.3673	15 57 25.9	9.387
17	0 19 55.36	2.3130	6 56 31.8	13.194	17	2 12 8.94	2.3686	16 6 45.9	9.279
18	0 22 14.16	2.3138	7 9 41.9	13.142	18	2 14 31.09	2.3698	16 15 59.4	9.172
19	0 24 33.01	2.3144	7 22 48.8	13.088	19	2 16 53.32	2.3712	16 25 6.5	9.063
20	0 26 51.89	2.3151	7 35 52.5	13.034	20	2 19 15.63	2.3724	16 34 7.0	8.953
21	0 29 10.82	2.3158	7 48 52.9	12.978	21	2 21 38.01	2.3737	16 43 0.9	8.843
22	0 31 29.79	2.3167	8 1 49.9	12.921	22	2 24 0.47	2.3749	16 51 48.2	8.733
23	0 33 48.82	2.3175	N. 8 14 43.4	12.862	23	2 26 23.00	2.3762	N.17 0 28.8	8.621
	TUESDAY 14.					THURSDAY 16.			
0	0 36 7.89	2.3183	N. 8 27 33.3	12.802	0	2 28 45.61	2.3774	N.17 9 2.7	8.508
1	0 38 27.01	2.3192	8 40 19.6	12.740	1	2 31 8.29	2.3785	17 17 29.8	8.394
2	0 40 46.19	2.3201	8 53 2.1	12.677	2	2 33 31.03	2.3796	17 25 50.0	8.280
3	0 43 5.42	2.3210	9 5 40.8	12.613	3	2 35 53.84	2.3808	17 34 3.4	8.165
4	0 45 24.71	2.3220	9 18 15.7	12.548	4	2 38 16.72	2.3819	17 42 9.8	8.049
5	0 47 44.06	2.3230	9 30 46.5	12.480	5	2 40 39.67	2.3830	17 50 9.3	7.933
6	0 50 3.47	2.3240	9 43 13.3	12.413	6	2 43 2.68	2.3840	17 58 1.8	7.816
7	0 52 22.94	2.3250	9 55 36.0	12.343	7	2 45 25.75	2.3851	18 5 47.3	7.698
8	0 54 42.47	2.3261	10 7 54.4	12.271	8	2 47 48.89	2.3862	18 13 25.7	7.581
9	0 57 2.07	2.3272	10 20 8.5	12.199	9	2 50 12.09	2.3871	18 20 57.0	7.462
10	0 59 21.74	2.3283	10 32 18.3	12.126	10	2 52 35.34	2.3880	18 28 21.1	7.342
11	1 1 41.47	2.3294	10 44 23.6	12.051	11	2 54 58.65	2.3889	18 35 38.0	7.221
12	1 4 1.27	2.3306	10 56 24.4	11.975	12	2 57 22.01	2.3898	18 42 47.6	7.100
13	1 6 21.14	2.3318	11 8 20.6	11.898	13	2 59 45.42	2.3906	18 49 50.0	6.979
14	1 8 41.08	2.3330	11 20 12.2	11.819	14	3 2 8.88	2.3914	18 56 45.1	6.858
15	1 11 1.10	2.3343	11 31 59.0	11.740	15	3 4 32.39	2.3923	19 3 32.9	6.735
16	1 13 21.19	2.3354	11 43 41.0	11.659	16	3 6 55.95	2.3929	19 10 13.3	6.613
17	1 15 41.35	2.3366	11 55 18.1	11.577	17	3 9 19.54	2.3936	19 16 46.4	6.489
18	1 18 1.58	2.3378	12 6 50.2	11.493	18	3 11 43.18	2.3943	19 23 12.0	6.365
19	1 20 21.89	2.3392	12 18 17.3	11.408	19	3 14 6.86	2.3949	19 29 30.2	6.241
20	1 22 42.28	2.3405	12 29 39.2	11.323	20	3 16 30.57	2.3954	19 35 40.9	6.116
21	1 25 2.75	2.3418	12 40 56.0	11.237	21	3 18 54.31	2.3959	19 41 44.1	5.991
22	1 27 23.29	2.3430	12 52 7.6	11.148	22	3 21 18.08	2.3964	19 47 39.8	5.865
23	1 29 43.91	2.3443	13 3 13.8	11.059	23	3 23 41.88	2.3969	19 53 27.9	5.739
24	1 32 4.61	2.3457	N.13 14 14.7	10.969	24	3 26 5.71	2.3973	N.19 59 8.5	5.613

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 17.					SUNDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 26 5.71	2.3973	N.19 59 8.5	5.613	0	5 20 34.65	2.3501	N.21 59 42.2	0.574
1	3 28 29.56	2.3977	20 4 41.4	5.486	1	5 22 55.58	2.3477	21 59 4.0	0.698
2	3 30 53.43	2.3979	20 10 6.8	5.359	2	5 25 16.37	2.3453	21 58 18.4	0.823
3	3 33 17.31	2.3981	20 15 24.5	5.231	3	5 27 37.01	2.3427	21 57 25.3	0.946
4	3 35 41.20	2.3983	20 20 34.5	5.103	4	5 29 57.49	2.3400	21 56 24.9	1.069
5	3 38 5.11	2.3985	20 25 36.8	4.975	5	5 32 17.81	2.3373	21 55 17.0	1.193
6	3 40 29.02	2.3986	20 30 31.5	4.847	6	5 34 37.97	2.3347	21 54 1.8	1.315
7	3 42 52.94	2.3987	20 35 18.5	4.718	7	5 36 57.97	2.3319	21 52 39.2	1.438
8	3 45 16.86	2.3986	20 39 57.7	4.589	8	5 39 17.80	2.3291	21 51 9.3	1.558
9	3 47 40.77	2.3985	20 44 29.2	4.460	9	5 41 37.46	2.3263	21 49 32.2	1.678
10	3 50 4.68	2.3985	20 48 52.9	4.331	10	5 43 56.95	2.3233	21 47 47.9	1.799
11	3 52 28.59	2.3983	20 53 8.9	4.202	11	5 46 16.26	2.3203	21 45 56.3	1.919
12	3 54 52.48	2.3981	20 57 17.1	4.072	12	5 48 35.39	2.3173	21 43 57.6	2.038
13	3 57 16.36	2.3978	21 1 17.5	3.942	13	5 50 54.34	2.3143	21 41 51.7	2.157
14	3 59 40.22	2.3974	21 5 10.1	3.812	14	5 53 13.10	2.3112	21 39 38.7	2.275
15	4 2 4.05	2.3970	21 8 54.9	3.682	15	5 55 31.68	2.3080	21 37 18.7	2.393
16	4 4 27.86	2.3966	21 12 32.0	3.552	16	5 57 50.06	2.3048	21 34 51.6	2.510
17	4 6 51.64	2.3961	21 16 1.2	3.422	17	6 0 8.25	2.3015	21 32 17.5	2.626
18	4 9 15.39	2.3955	21 19 22.6	3.291	18	6 2 26.24	2.2983	21 29 36.5	2.742
19	4 11 39.10	2.3948	21 22 36.1	3.160	19	6 4 44.04	2.2949	21 26 48.5	2.857
20	4 14 2.77	2.3942	21 25 41.8	3.030	20	6 7 1.63	2.2915	21 23 53.7	2.971
21	4 16 26.40	2.3934	21 28 39.7	2.899	21	6 9 19.02	2.2882	21 20 52.0	3.085
22	4 18 49.98	2.3926	21 31 29.7	2.768	22	6 11 36.21	2.2848	21 17 43.5	3.198
23	4 21 13.51	2.3917	N.21 34 11.9	2.638	23	6 13 53.19	2.2812	N.21 14 28.2	3.311
	SATURDAY 18.					MONDAY 20.			
0	4 23 36.98	2.3908	N.21 36 46.3	2.508	0	6 16 9.95	2.2776	N.21 11 6.2	3.423
1	4 26 0.40	2.3898	21 39 12.8	2.377	1	6 18 26.50	2.2741	21 7 37.5	3.533
2	4 28 23.76	2.3888	21 41 31.5	2.247	2	6 20 42.84	2.2705	21 4 2.2	3.643
3	4 30 47.05	2.3876	21 43 42.4	2.117	3	6 22 58.96	2.2668	21 0 20.3	3.753
4	4 33 10.27	2.3864	21 45 45.5	1.987	4	6 25 14.86	2.2632	20 56 31.8	3.863
5	4 35 33.42	2.3852	21 47 40.8	1.856	5	6 27 30.54	2.2594	20 52 36.8	3.971
6	4 37 56.50	2.3839	21 49 28.2	1.726	6	6 29 45.99	2.2557	20 48 35.3	4.078
7	4 40 19.49	2.3825	21 51 7.9	1.597	7	6 32 1.22	2.2519	20 44 27.4	4.184
8	4 42 42.40	2.3812	21 52 39.8	1.467	8	6 34 16.22	2.2481	20 40 13.2	4.291
9	4 45 5.23	2.3797	21 54 3.9	1.338	9	6 36 30.99	2.2443	20 35 52.5	4.398
10	4 47 27.96	2.3781	21 55 20.3	1.208	10	6 38 45.54	2.2405	20 31 25.5	4.502
11	4 49 50.60	2.3766	21 56 28.9	1.078	11	6 40 59.85	2.2366	20 26 52.3	4.605
12	4 52 13.15	2.3749	21 57 29.7	0.949	12	6 43 13.93	2.2327	20 22 12.9	4.708
13	4 54 35.59	2.3731	21 58 22.8	0.821	13	6 45 27.77	2.2288	20 17 27.3	4.811
14	4 56 57.92	2.3713	21 59 8.2	0.693	14	6 47 41.38	2.2248	20 12 35.6	4.912
15	4 59 20.15	2.3695	21 59 45.9	0.565	15	6 49 54.75	2.2208	20 7 37.9	5.013
16	5 1 42.26	2.3675	22 0 16.0	0.438	16	6 52 7.88	2.2168	20 2 34.1	5.113
17	5 4 4.25	2.3656	22 0 38.4	0.309	17	6 54 20.77	2.2128	19 57 24.4	5.212
18	5 6 26.13	2.3636	22 0 53.1	0.182	18	6 56 33.42	2.2088	19 52 8.7	5.310
19	5 8 47.88	2.3614	22 1 0.3	+ 0.056	19	6 58 45.83	2.2048	19 46 47.2	5.408
20	5 11 9.50	2.3593	22 0 59.8	− 0.072	20	7 0 58.00	2.2008	19 41 19.8	5.504
21	5 13 30.99	2.3571	22 0 51.7	0.198	21	7 3 9.92	2.1966	19 35 46.7	5.600
22	5 15 52.35	2.3548	22 0 36.1	0.323	22	7 5 21.59	2.1925	19 30 7.8	5.696
23	5 18 13.57	2.3525	22 0 12.9	0.449	23	7 7 33.02	2.1884	19 24 23.2	5.790
24	5 20 34.65	2.3501	N.21 59 42.2	0.574	24	7 9 44.20	2.1843	N.19 18 33.0	5.883

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 21.					**THURSDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 9 44.20	2.1843	N.19 18 33.0	5.883	0	8 49 51.84	1.9924	N.13 4 38.4	9.365
1	7 11 55.13	2.1802	19 12 37.2	5.976	1	8 51 51.28	1.9888	12 55 14.9	9.417
2	7 14 5.82	2.1761	19 6 35.9	6.068	2	8 53 50.50	1.9853	12 45 48.4	9.468
3	7 16 16.26	2.1719	19 0 29.0	6.160	3	8 55 49.51	1.9818	12 36 18.8	9.518
4	7 18 26.45	2.1678	18 54 16.7	6.249	4	8 57 48.32	1.9784	12 26 46.3	9.566
5	7 20 36.39	2.1637	18 47 59.1	6.338	5	8 59 46.92	1.9750	12 17 10.9	9.614
6	7 22 46.09	2.1595	18 41 36.1	6.427	6	9 1 45.32	1.9717	12 7 32.6	9.662
7	7 24 55.53	2.1553	18 35 7.9	6.514	7	9 3 43.52	1.9683	11 57 51.4	9.709
8	7 27 4.72	2.1511	18 28 34.4	6.602	8	9 5 41.52	1.9650	11 48 7.5	9.754
9	7 29 13.66	2.1469	18 21 55.7	6.688	9	9 7 39.32	1.9617	11 38 20.9	9.799
10	7 31 22.35	2.1428	18 15 11.9	6.772	10	9 9 36.92	1.9584	11 28 31.6	9.843
11	7 33 30.79	2.1386	18 8 23.1	6.856	11	9 11 34.33	1.9553	11 18 39.7	9.887
12	7 35 38.98	2.1344	18 1 29.2	6.940	12	9 13 31.55	1.9521	11 8 45.2	9.929
13	7 37 46.92	2.1303	17 54 30.3	7.023	13	9 15 28.58	1.9489	10 58 48.2	9.971
14	7 39 54.61	2.1261	17 47 26.5	7.104	14	9 17 25.42	1.9458	10 48 48.6	10.012
15	7 42 2.05	2.1219	17 40 17.8	7.185	15	9 19 22.08	1.9428	10 38 46.7	10.052
16	7 44 9.24	2.1178	17 33 4.3	7.264	16	9 21 18.55	1.9397	10 28 42.4	10.091
17	7 46 16.18	2.1136	17 25 46.1	7.343	17	9 23 14.84	1.9367	10 18 35.8	10.129
18	7 48 22.87	2.1094	17 18 23.1	7.422	18	9 25 10.95	1.9338	10 8 26.9	10.167
19	7 50 29.31	2.1053	17 10 55.5	7.499	19	9 27 6.89	1.9309	9 58 15.7	10.204
20	7 52 35.51	2.1013	17 3 23.2	7.576	20	9 29 2.66	1.9280	9 48 2.4	10.240
21	7 54 41.46	2.0971	16 55 46.4	7.651	21	9 30 58.25	1.9251	9 37 46.9	10.276
22	7 56 47.16	2.0930	16 48 5.0	7.726	22	9 32 53.67	1.9223	9 27 29.3	10.310
23	7 58 52.62	2.0889	N.16 40 19.2	7.799	23	9 34 48.93	1.9196	N. 9 17 9.7	10.344
	WEDNESDAY 22.					**FRIDAY 24.**			
0	8 0 57.83	2.0848	N.16 32 29.1	7.872	0	9 36 44.02	1.9168	N. 9 6 48.0	10.378
1	8 3 2.80	2.0808	16 24 34.6	7.944	1	9 38 38.95	1.9142	8 56 24.4	10.409
2	8 5 7.52	2.0767	16 16 35.8	8.016	2	9 40 33.72	1.9115	8 45 58.9	10.440
3	8 7 12.00	2.0726	16 8 32.7	8.087	3	9 42 28.33	1.9089	8 35 31.6	10.471
4	8 9 16.23	2.0686	16 0 25.4	8.156	4	9 44 22.79	1.9063	8 25 2.4	10.501
5	8 11 20.23	2.0646	15 52 14.0	8.224	5	9 46 17.09	1.9038	8 14 31.5	10.530
6	8 13 23.98	2.0605	15 43 58.5	8.292	6	9 48 11.24	1.9013	8 3 58.8	10.558
7	8 15 27.49	2.0566	15 35 39.0	8.359	7	9 50 5.25	1.8990	7 53 24.5	10.586
8	8 17 30.77	2.0527	15 27 15.4	8.426	8	9 51 59.12	1.8966	7 42 48.5	10.613
9	8 19 33.81	2.0487	15 18 47.9	8.490	9	9 53 52.84	1.8942	7 32 10.9	10.639
10	8 21 36.61	2.0448	15 10 16.6	8.554	10	9 55 46.42	1.8918	7 21 31.8	10.664
11	8 23 39.18	2.0408	15 1 41.4	8.618	11	9 57 39.86	1.8896	7 10 51.2	10.688
12	8 25 41.51	2.0369	14 53 2.4	8.681	12	9 59 33.17	1.8874	7 0 9.2	10.712
13	8 27 43.61	2.0332	14 44 19.7	8.743	13	10 1 26.35	1.8853	6 49 25.8	10.735
14	8 29 45.49	2.0293	14 35 33.3	8.803	14	10 3 19.40	1.8831	6 38 41.0	10.758
15	8 31 47.13	2.0254	14 26 43.3	8.863	15	10 5 12.32	1.8809	6 27 54.9	10.779
16	8 33 48.54	2.0217	14 17 49.7	8.923	16	10 7 5.11	1.8789	6 17 7.5	10.800
17	8 35 49.73	2.0179	14 8 52.6	8.981	17	10 8 57.79	1.8769	6 6 18.9	10.820
18	8 37 50.69	2.0142	13 59 52.0	9.038	18	10 10 50.34	1.8749	5 55 29.1	10.840
19	8 39 51.43	2.0105	13 50 48.0	9.095	19	10 12 42.78	1.8731	5 44 38.1	10.859
20	8 41 51.95	2.0068	13 41 40.6	9.151	20	10 14 35.11	1.8712	5 33 46.0	10.877
21	8 43 52.25	2.0032	13 32 29.9	9.206	21	10 16 27.32	1.8693	5 22 52.9	10.893
22	8 45 52.33	1.9995	13 23 15.9	9.260	22	10 18 19.43	1.8676	5 11 58.8	10.910
23	8 47 52.19	1.9959	13 13 58.7	9.313	23	10 20 11.43	1.8658	5 1 3.7	10.926
24	8 49 51.84	1.9924	N.13 4 38.4	9.365	24	10 22 3.32	1.8640	N. 4 50 7.7	10.941

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 25.					MONDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 22 3.32	1.8640	N. 4 50 7.7	10.941	0	11 50 27.20	1.8370	S. 3 59 19.2	10.864
1	10 23 55.11	1.8624	4 39 10.8	10.955	1	11 52 17.44	1.8377	4 10 10.5	10.847
2	10 25 46.81	1.8608	4 28 13.1	10.968	2	11 54 7.72	1.8383	4 21 0.8	10.829
3	10 27 38.41	1.8593	4 17 14.6	10.982	3	11 55 58.04	1.8390	4 31 50.0	10.810
4	10 29 29.92	1.8578	4 6 15.3	10.994	4	11 57 48.40	1.8398	4 42 38.0	10.790
5	10 31 21.34	1.8563	3 55 15.3	11.006	5	11 59 38.81	1.8405	4 53 24.8	10.770
6	10 33 12.68	1.8549	3 44 14.6	11.017	6	12 1 29.26	1.8413	5 4 10.4	10.750
7	10 35 3.93	1.8535	3 33 13.3	11.027	7	12 3 19.76	1.8422	5 14 54.8	10.728
8	10 36 55.10	1.8522	3 22 11.4	11.036	8	12 5 10.32	1.8431	5 25 37.8	10.706
9	10 38 46.19	1.8508	3 11 9.0	11.044	9	12 7 0.93	1.8440	5 36 19.5	10.684
10	10 40 37.20	1.8496	3 0 6.1	11.053	10	12 8 51.60	1.8451	5 46 59.9	10.661
11	10 42 28.14	1.8484	2 49 2.7	11.060	11	12 10 42.34	1.8461	5 57 38.8	10.636
12	10 44 19.01	1.8473	2 37 58.9	11.067	12	12 12 33.13	1.8472	6 8 16.2	10.612
13	10 46 9.81	1.8462	2 26 54.7	11.073	13	12 14 24.00	1.8483	6 18 52.2	10.587
14	10 48 0.55	1.8452	2 15 50.2	11.078	14	12 16 14.93	1.8494	6 29 26.6	10.561
15	10 49 51.23	1.8442	2 4 45.4	11.083	15	12 18 5.93	1.8507	6 39 59.5	10.535
16	10 51 41.85	1.8432	1 53 40.2	11.087	16	12 19 57.01	1.8520	6 50 30.8	10.508
17	10 53 32.41	1.8423	1 42 34.9	11.089	17	12 21 48.17	1.8533	7 1 0.4	10.480
18	10 55 22.92	1.8414	1 31 29.5	11.092	18	12 23 39.41	1.8547	7 11 28.4	10.452
19	10 57 13.38	1.8406	1 20 23.9	11.094	19	12 25 30.73	1.8561	7 21 54.7	10.423
20	10 59 3.79	1.8398	1 9 18.2	11.095	20	12 27 22.14	1.8576	7 32 19.2	10.393
21	11 0 54.15	1.8390	0 58 12.5	11.096	21	12 29 13.64	1.8591	7 42 41.9	10.363
22	11 2 44.47	1.8383	0 47 6.7	11.096	22	12 31 5.23	1.8606	7 53 2.8	10.333
23	11 4 34.75	1.8377	N. 0 36 1.0	11.095	23	12 32 56.91	1.8622	S. 8 3 21.9	10.302
	SUNDAY 26.					TUESDAY 28.			
0	11 6 24.99	1.8371	N. 0 24 55.3	11.094	0	12 34 48.69	1.8638	S. 8 13 39.0	10.269
1	11 8 15.20	1.8366	0 13 49.7	11.092	1	12 36 40.57	1.8655	8 23 54.2	10.237
2	11 10 5.38	1.8361	N. 0 2 44.3	11.088	2	12 38 32.55	1.8672	8 34 7.4	10.203
3	11 11 55.53	1.8357	S. 0 8 20.9	11.085	3	12 40 24.63	1.8689	8 44 18.6	10.169
4	11 13 45.66	1.8352	0 19 25.9	11.082	4	12 42 16.82	1.8708	8 54 27.7	10.135
5	11 15 35.76	1.8348	0 30 30.7	11.077	5	12 44 9.12	1.8727	9 4 34.8	10.100
6	11 17 25.84	1.8346	0 41 35.1	11.071	6	12 46 1.54	1.8746	9 14 39.7	10.063
7	11 19 15.91	1.8344	0 52 39.2	11.065	7	12 47 54.07	1.8764	9 24 42.4	10.028
8	11 21 5.97	1.8342	1 3 42.9	11.058	8	12 49 46.71	1.8784	9 34 43.0	9.991
9	11 22 56.01	1.8339	1 14 46.2	11.051	9	12 51 39.48	1.8805	9 44 41.3	9.953
10	11 24 46.04	1.8338	1 25 49.0	11.043	10	12 53 32.37	1.8825	9 54 37.3	9.914
11	11 26 36.07	1.8338	1 36 51.4	11.035	11	12 55 25.38	1.8846	10 4 31.0	9.875
12	11 28 26.10	1.8338	1 47 53.2	11.025	12	12 57 18.52	1.8868	10 14 22.3	9.835
13	11 30 16.13	1.8338	1 58 54.4	11.016	13	12 59 11.79	1.8889	10 24 11.2	9.795
14	11 32 6.16	1.8338	2 9 55.1	11.005	14	13 1 5.19	1.8912	10 33 57.7	9.754
15	11 33 56.19	1.8339	2 20 55.0	10.993	15	13 2 58.73	1.8935	10 43 41.7	9.713
16	11 35 46.23	1.8341	2 31 54.3	10.983	16	13 4 52.41	1.8958	10 53 23.2	9.670
17	11 37 36.28	1.8343	2 42 52.9	10.970	17	13 6 46.23	1.8982	11 3 2.1	9.628
18	11 39 26.35	1.8347	2 53 50.7	10.957	18	13 8 40.19	1.9005	11 12 38.6	9.584
19	11 41 16.44	1.8349	3 4 47.7	10.943	19	13 10 34.29	1.9029	11 22 12.3	9.540
20	11 43 6.54	1.8353	3 15 43.8	10.928	20	13 12 28.54	1.9054	11 31 43.4	9.495
21	11 44 56.67	1.8357	3 26 39.1	10.913	21	13 14 22.94	1.9079	11 41 11.7	9.449
22	11 46 46.82	1.8361	3 37 33.4	10.898	22	13 16 17.49	1.9105	11 50 37.3	9.403
23	11 48 37.00	1.8365	3 48 26.8	10.882	23	13 18 12.20	1.9132	12 0 0.1	9.357
24	11 50 27.20	1.8370	S. 3 59 19.2	10.864	24	13 20 7.07	1.9158	S. 12 9 20.1	9.309

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 29.			
	h m s	s	° ′ ″	″
0	13 20 7.07	1.9158	S.12 9 20.1	9.309
1	13 22 2.09	1.9184	12 18 37.2	9.261
2	13 23 57.28	1.9212	12 27 51.4	9.213
3	13 25 52.63	1.9239	12 37 2.7	9.163
4	13 27 48.15	1.9267	12 46 11.0	9.113
5	13 29 43.83	1.9295	12 55 16.3	9.063
6	13 31 39.69	1.9324	13 4 18.5	9.011
7	13 33 35.72	1.9353	13 13 17.6	8.959
8	13 35 31.92	1.9382	13 22 13.6	8.907
9	13 37 28.30	1.9411	13 31 6.4	8.853
10	13 39 24.85	1.9441	13 39 56.0	8.799
11	13 41 21.59	1.9472	13 48 42.3	8.744
12	13 43 18.51	1.9503	13 57 25.3	8.689
13	13 45 15.62	1.9533	14 6 5.0	8.633
14	13 47 12.91	1.9564	14 14 41.3	8.576
15	13 49 10.39	1.9597	14 23 14.1	8.518
16	13 51 8.07	1.9629	14 31 43.5	8.461
17	13 53 5.94	1.9661	14 40 9.4	8.403
18	13 55 4.00	1.9693	14 48 31.8	8.343
19	13 57 2.26	1.9727	14 56 50.6	8.283
20	13 59 0.72	1.9760	15 5 5.7	8.222
21	14 0 59.38	1.9793	15 13 17.2	8.161
22	14 2 58.24	1.9827	15 21 25.0	8.098
23	14 4 57.30	1.9861	S.15 29 29.0	8.035
	THURSDAY 30.			
0	14 6 56.57	1.9896	S.15 37 29.2	7.972
1	14 8 56.05	1.9931	15 45 25.6	7.908
2	14 10 55.74	1.9966	15 53 18.1	7.843
3	14 12 55.64	2.0001	16 1 6.7	7.777
4	14 14 55.75	2.0037	16 8 51.3	7.710
5	14 16 56.08	2.0073	16 16 31.9	7.643
6	14 18 56.62	2.0108	16 24 8.5	7.576
7	14 20 57.38	2.0145	16 31 41.0	7.508
8	14 22 58.36	2.0182	16 39 9.4	7.438
9	14 24 59.56	2.0218	16 46 33.6	7.368
10	14 27 0.98	2.0255	16 53 53.6	7.298
11	14 29 2.62	2.0293	17 1 9.3	7.226
12	14 31 4.49	2.0330	17 8 20.7	7.154
13	14 33 6.58	2.0368	17 15 27.8	7.082
14	14 35 8.90	2.0406	17 22 30.5	7.008
15	14 37 11.45	2.0444	17 29 28.7	6.933
16	14 39 14.23	2.0483	17 36 22.5	6.859
17	14 41 17.24	2.0520	17 43 11.8	6.783
18	14 43 20.47	2.0558	17 49 56.5	6.707
19	14 45 23.94	2.0598	17 56 36.7	6.630
20	14 47 27.65	2.0638	18 3 12.2	6.553
21	14 49 31.59	2.0676	18 9 43.0	6.474
22	14 51 35.76	2.0715	18 16 9.1	6.395
23	14 53 40.17	2.0755	18 22 30.4	6.315
24	14 55 44.82	2.0794	S.18 28 46.9	6.234

Hour.	Right Ascension	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 31.			
	h m s	s	° ′ ″	″
0	14 55 44.82	2.0794	S.18 28 46.9	6.234
1	14 57 49.70	2.0834	18 34 58.5	6.153
2	14 59 54.83	2.0874	18 41 5.2	6.071
3	15 2 0.19	2.0913	18 47 7.0	5.988
4	15 4 5.79	2.0953	18 53 3.8	5.905
5	15 6 11.63	2.0993	18 58 55.6	5.821
6	15 8 17.71	2.1033	19 4 42.3	5.736
7	15 10 24.03	2.1073	19 10 23.9	5.651
8	15 12 30.59	2.1113	19 16 0.4	5.564
9	15 14 37.39	2.1154	19 21 31.6	5.477
10	15 16 44.44	2.1194	19 26 57.6	5.389
11	15 18 51.72	2.1234	19 32 18.3	5.301
12	15 20 59.25	2.1275	19 37 33.7	5.212
13	15 23 7.02	2.1315	19 42 43.7	5.122
14	15 25 15.03	2.1356	19 47 48.3	5.031
15	15 27 23.29	2.1397	19 52 47.4	4.939
16	15 29 31.79	2.1437	19 57 41.0	4.848
17	15 31 40.53	2.1477	20 2 29.1	4.755
18	15 33 49.51	2.1518	20 7 11.6	4.661
19	15 35 58.74	2.1558	20 11 48.4	4.567
20	15 38 8.21	2.1598	20 16 19.6	4.473
21	15 40 17.91	2.1638	20 20 45.1	4.377
22	15 42 27.86	2.1678	20 25 4.8	4.280
23	15 44 38.05	2.1718	S.20 29 18.7	4.183
	SATURDAY, SEPTEMBER 1.			
0	15 46 48.47	2.1758	S.20 33 26.8	4.086

PHASES OF THE MOON.

			d	h	m
☽	First Quarter . .	August	3	4	45.6
○	Full Moon		10	9	29.9
☾	Last Quarter		16	23	46.3
●	New Moon		24	15	52.6

			d	h
☾	Perigee	August	11	23.1
☾	Apogee		27	10.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Sun	W.	65 53 1	3450	67 14 21	3446	68 35 45	3442	69 57 13	3438
	Jupiter	E.	46 41 13	3075	45 12 33	3073	43 43 50	3069	42 15 2	3065
	Antares	E.	53 39 30	3090	52 11 8	3088	50 42 44	3085	49 14 16	3082
	Saturn	E.	74 47 21	3052	73 18 13	3049	71 49 1	3045	70 19 44	3042
	α Aquilæ	E.	105 48 49	3542	104 29 11	3533	103 9 23	3524	101 49 25	3514
2	Sun	W.	76 46 2	3408	78 8 9	3401	79 30 24	3393	80 52 48	3385
	Antares	E.	41 50 53	3062	40 21 57	3058	38 52 56	3052	37 23 48	3047
	Saturn	E.	62 51 57	3014	61 22 3	3008	59 52 0	3001	58 21 49	2993
	α Aquilæ	E.	95 7 6	3472	93 46 11	3463	92 25 6	3454	91 3 51	3446
3	Sun	W.	87 47 25	3336	89 10 55	3325	90 34 38	3313	91 58 34	3300
	Spica	W.	15 58 56	2985	17 29 28	2973	19 0 15	2959	20 31 19	2946
	Antares	E.	29 56 33	3022	28 26 47	3018	26 56 56	3013	25 26 58	3010
	Saturn	E.	50 48 20	2950	49 17 4	2939	47 45 34	2928	46 13 51	2916
	α Aquilæ	E.	84 15 22	3408	82 53 14	3400	81 30 58	3393	80 8 34	3386
	Fomalhaut	E.	111 17 46	3510	109 57 33	3489	108 36 57	3470	107 15 59	3449
4	Sun	W.	99 2 0	3234	100 27 29	3219	101 53 16	3204	103 19 20	3189
	Spica	W.	28 10 55	2877	29 43 43	2862	31 16 50	2848	32 50 15	2833
	Saturn	E.	38 31 32	2855	36 58 16	2842	35 24 43	2828	33 50 52	2814
	α Aquilæ	E.	73 14 36	3355	71 51 28	3350	70 28 15	3345	69 4 56	3342
	Fomalhaut	E.	100 25 38	3355	99 2 30	3338	97 39 2	3319	96 15 13	3302
	α Pegasi	E.	120 5 11	3056	118 36 7	3036	117 6 39	3017	115 36 47	2998
5	Sun	W.	110 34 25	3107	112 2 26	3090	113 30 48	3073	114 59 31	3055
	Spica	W.	40 42 20	2755	42 17 47	2738	43 53 37	2721	45 29 49	2704
	Saturn	E.	25 56 49	2738	24 21 0	2722	22 44 50	2707	21 8 19	2691
	α Aquilæ	E.	62 7 36	3336	60 44 6	3339	59 20 40	3343	57 57 18	3349
	Fomalhaut	E.	89 11 15	3221	87 45 31	3205	86 19 28	3190	84 53 7	3176
	α Pegasi	E.	108 1 35	2905	106 29 22	2885	104 56 44	2866	103 23 42	2848
6	Sun	W.	122 28 39	2964	123 59 37	2946	125 30 58	2927	127 2 42	2909
	Spica	W.	53 36 34	2617	55 15 6	2599	56 54 3	2580	58 33 25	2562
	Jupiter	W.	14 53 7	2640	16 31 7	2618	18 9 37	2597	19 48 36	2577
	α Aquilæ	E.	51 2 55	3413	49 40 53	3435	48 19 16	3461	46 58 8	3493
	Fomalhaut	E.	77 37 18	3112	76 9 23	3101	74 41 15	3091	73 12 55	3082
	α Pegasi	E.	95 32 30	2755	93 57 3	2737	92 21 12	2718	90 44 55	2701
7	Spica	W.	66 56 30	2472	68 38 23	2454	70 20 41	2436	72 3 25	2418
	Jupiter	W.	28 10 4	2484	29 51 40	2465	31 33 42	2447	33 16 10	2429
	Antares	W.	21 50 32	2560	23 30 22	2532	25 10 51	2505	26 51 57	2480
	Fomalhaut	E.	65 48 58	3055	64 19 53	3055	62 50 48	3055	61 21 43	3057
	α Pegasi	E.	82 37 38	2612	80 59 0	2596	79 20 0	2580	77 40 37	2564
8	Spica	W.	80 43 22	2331	82 28 36	2315	84 14 14	2299	86 0 16	2283
	Jupiter	W.	41 54 49	2342	43 39 47	2325	45 25 10	2309	47 10 56	2293
	Antares	W.	35 25 59	2368	37 10 19	2349	38 55 7	2330	40 40 23	2312
	Saturn	W.	14 15 7	2325	16 0 30	2307	17 46 19	2289	19 32 34	2272
	Fomalhaut	E.	53 58 13	3113	52 30 19	3133	51 2 50	3159	49 35 52	3191
	α Pegasi	E.	69 18 30	2493	67 37 7	2480	65 55 26	2468	64 13 28	2458
	α Arietis	E.	112 17 6	2369	110 32 47	2353	108 48 4	2336	107 2 56	2319

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^h.	P. L. of Diff.	XVIII^h.	P. L. of Diff.	XXI^h.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Sun	W.	71 18 46	3433	72 40 25	3428	74 2 10	3422	75 24 2	3415
	Jupiter	E.	40 46 9	3061	39 17 12	3056	37 48 9	3051	36 19 0	3046
	Antares	E.	47 45 44	3079	46 17 9	3075	44 48 29	3071	43 19 44	3066
	Saturn	E.	68 50 23	3037	67 20 56	3032	65 51 23	3027	64 21 44	3021
	a Aquilæ	E.	100 29 16	3506	99 8 58	3497	97 48 30	3488	96 27 53	3480
2	Sun	W.	82 15 22	3376	83 38 6	3366	85 1 1	3356	86 24 7	3346
	Antares	E.	35 54 34	3043	34 25 14	3037	32 55 47	3031	31 26 13	3026
	Saturn	E.	56 51 28	2986	55 20 58	2977	53 50 17	2968	52 19 24	2959
	a Aquilæ	E.	89 42 26	3438	88 20 53	3431	86 59 12	3423	85 37 21	3415
3	Sun	W.	93 22 45	3288	94 47 10	3275	96 11 51	3262	97 36 47	3247
	Spica	W.	22 2 39	2932	23 34 17	2919	25 6 12	2905	26 38 25	2891
	Antares	E.	23 56 58	3011	22 26 59	3011	20 57 1	3010	19 27 0	3011
	Saturn	E.	44 41 53	2905	43 9 41	2893	41 37 14	2881	40 4 31	2869
	a Aquilæ	E.	78 46 1	3379	77 23 20	3373	76 0 33	3366	74 37 38	3360
	Fomalhaut	E.	105 54 38	3431	104 32 56	3411	103 10 51	3392	101 48 25	3373
4	Sun	W.	104 45 42	3173	106 12 23	3157	107 39 24	3141	109 6 44	3124
	Spica	W.	34 24 0	2818	35 58 4	2802	37 32 29	2787	39 7 14	2771
	Saturn	E.	32 16 42	2799	30 42 13	2785	29 7 25	2769	27 32 17	2754
	a Aquilæ	E.	67 41 33	3339	66 18 7	3337	64 54 38	3335	63 31 7	3335
	Fomalhaut	E.	94 51 4	3286	93 26 36	3269	92 1 48	3253	90 36 41	3237
	a Pegasi	E.	114 6 32	2979	112 35 53	2961	111 4 51	2942	109 33 25	2923
5	Sun	W.	116 28 36	3037	117 58 3	3018	119 27 53	3001	120 58 5	2983
	Spica	W.	47 6 24	2687	48 43 21	2670	50 20 41	2652	51 58 25	2634
	Saturn	E.	19 31 27	2675	17 54 13	2657	16 16 36	2642	14 38 38	2626
	a Aquilæ	E.	56 34 2	3356	55 10 55	3366	53 48 0	3379	52 25 19	3393
	Fomalhaut	E.	83 26 29	3163	81 59 35	3149	80 32 25	3136	79 4 59	3124
	a Pegasi	E.	101 50 16	2829	100 16 26	2810	98 42 12	2792	97 7 33	2773
6	Sun	W.	128 34 50	2891	130 7 21	2872	131 40 16	2854	133 13 34	2835
	Spica	W.	60 13 12	2544	61 53 24	2527	63 34 0	2508	65 15 2	2489
	Jupiter	W.	21 28 2	2559	23 7 53	2540	24 48 10	2521	26 28 54	2502
	a Aquilæ	E.	45 37 36	3531	44 17 46	3574	42 58 43	3625	41 40 36	3683
	Fomalhaut	E.	71 44 24	3075	70 15 44	3068	68 46 55	3062	67 17 59	3058
	a Pegasi	E.	89 8 16	2682	87 31 12	2664	85 53 44	2647	84 15 53	2629
7	Spica	W.	73 46 34	2401	75 30 8	2382	77 14 8	2365	78 58 33	2348
	Jupiter	W.	34 59 3	2411	36 42 22	2394	38 26 6	2376	40 10 15	2359
	Antares	W.	28 33 39	2455	30 15 56	2431	31 58 47	2410	33 42 8	2389
	Fomalhaut	E.	59 52 41	3063	58 23 46	3071	56 55 1	3081	55 26 28	3096
	a Pegasi	E.	76 0 53	2548	74 20 47	2534	72 40 21	2520	70 59 35	2506
8	Spica	W.	87 46 41	2267	89 33 29	2252	91 20 39	2237	93 8 12	2223
	Jupiter	W.	48 57 6	2277	50 43 39	2262	52 30 34	2247	54 17 52	2233
	Antares	W.	42 26 5	2294	44 12 13	2277	45 58 46	2260	47 45 44	2245
	Saturn	W.	21 19 14	2257	23 6 17	2242	24 53 42	2227	26 41 30	2212
	Fomalhaut	E.	48 9 32	3227	46 43 55	3270	45 19 9	3321	43 55 22	3380
	a Pegasi	E.	62 31 16	2448	60 48 50	2440	59 6 12	2432	57 23 23	2426
	a Arietis	E.	105 17 24	2302	103 31 28	2287	101 45 9	2271	99 58 27	2257

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
9	Jupiter	W.	56 5 30	2218	57 53 30	2204	59 41 51	2192	61 30 31	2180
	Antares	W.	49 33 5	2230	51 20 48	2215	53 8 53	2201	54 57 19	2187
	Saturn	W.	28 29 40	2198	30 18 11	2184	32 7 3	2171	33 56 14	2158
	Fomalhaut	E.	42 32 43	3449	41 11 22	3531	39 51 32	3624	38 33 24	3735
	a Arietis	E.	98 11 23	2243	96 23 59	2229	94 36 14	2214	92 48 8	2202
10	Jupiter	W.	70 38 12	2126	72 28 32	2117	74 19 5	2109	76 9 51	2100
	Antares	W.	64 4 15	2130	65 54 28	2120	67 44 56	2111	69 35 38	2103
	Saturn	W.	43 6 40	2104	44 57 33	2094	46 48 41	2086	48 40 2	2079
	Fomalhaut	E.	32 37 40	4632	31 35 43	4922	30 37 46	5271	29 44 17	5683
	a Arietis	E.	83 43 18	2149	81 53 34	2140	80 3 36	2132	78 13 26	2124
	Aldebaran	E.	116 47 19	2138	114 57 18	2128	113 7 1	2119	111 16 30	2111
11	Jupiter	W.	85 26 25	2071	87 18 8	2067	89 9 58	2064	91 1 52	2062
	Antares	W.	78 51 55	2072	80 43 37	2069	82 35 24	2065	84 27 17	2062
	Saturn	W.	57 59 24	2050	59 51 41	2045	61 44 5	2042	63 36 34	2039
	a Aquilæ	W.	34 52 42	3753	36 8 33	3598	37 27 9	3468	38 48 9	3351
	a Arietis	E.	69 0 8	2099	67 9 7	2096	65 18 2	2094	63 26 54	2094
	Aldebaran	E.	102 1 6	2079	100 9 34	2075	98 17 56	2072	96 26 13	2068
	Venus	E.	133 38 30	2192	131 49 50	2187	130 1 3	2184	128 12 12	2182
12	Jupiter	W.	100 22 0	2060	102 14 1	2062	104 6 0	2064	105 57 55	2067
	Saturn	W.	72 59 35	2038	74 52 11	2039	76 44 45	2041	78 37 16	2044
	a Aquilæ	W.	46 1 33	2961	47 32 35	2908	49 4 44	2863	50 37 50	2822
	a Arietis	E.	54 11 18	2101	52 20 21	2105	50 29 30	2111	48 38 48	2117
	Aldebaran	E.	87 6 56	2066	85 15 4	2068	83 23 15	2070	81 31 29	2073
	Venus	E.	119 7 27	2182	117 18 32	2180	115 29 41	2180	113 40 54	2180
	Pollux	E.	128 47 18	2157	126 57 46	2153	125 8 8	2151	123 18 26	2149
13	Saturn	W.	87 58 23	2066	89 50 14	2073	91 41 55	2079	93 33 26	2087
	Aldebaran	E.	72 14 7	2097	70 23 3	2104	68 32 10	2111	66 41 28	2119
	Venus	E.	104 38 34	2218	102 50 33	2225	101 2 42	2233	99 15 3	2241
	Pollux	E.	114 9 52	2157	112 20 19	2161	110 30 53	2166	108 41 34	2171
14	Saturn	W.	102 47 52	2131	104 38 4	2142	106 27 59	2152	108 17 39	2163
	Fomalhaut	W.	45 58 15	3131	47 25 47	3084	48 54 16	3043	50 23 34	3008
	Aldebaran	E.	57 31 17	2167	55 42 0	2179	53 53 1	2191	52 4 19	2203
	Venus	E.	90 20 8	2290	88 33 54	2302	86 47 57	2313	85 2 16	2325
	Pollux	E.	99 37 27	2210	97 49 15	2219	96 1 16	2229	94 13 32	2239
	Sun	E.	129 26 54	2459	127 44 43	2469	126 2 46	2480	124 21 4	2491
15	Saturn	W.	117 21 49	2221	119 9 45	2233	120 57 23	2246	122 44 42	2259
	Fomalhaut	W.	57 59 6	2899	59 31 26	2888	61 4 0	2878	62 36 47	2871
	Aldebaran	E.	43 5 40	2272	41 18 59	2288	39 32 42	2304	37 46 48	2321
	Venus	E.	76 18 24	2389	74 34 34	2404	72 51 5	2417	71 7 55	2431
	Pollux	E.	85 18 56	2298	83 32 54	2311	81 47 11	2324	80 1 47	2338
	Sun	E.	115 56 30	2550	114 16 26	2562	112 36 39	2575	110 57 10	2589
16	Fomalhaut	W.	70 22 7	2864	71 55 12	2866	73 28 14	2870	75 1 11	2876
	Venus	E.	62 37 10	2504	60 56 3	2520	59 15 17	2535	57 34 52	2550
	Pollux	E.	71 19 52	2410	69 36 32	2426	67 53 34	2441	66 10 57	2457
	Sun	E.	102 44 26	2658	101 6 50	2673	99 29 34	2687	97 52 37	2702

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
9	JUPITER	W.	63 19 29	2168	65 8 45	2157	66 58 18	2146	68 48 7	2136
	Antares	W.	56 46 6	2174	58 35 12	2163	60 24 35	2151	62 14 17	2140
	SATURN	W.	35 45 45	2146	37 35 34	2135	39 25 39	2124	41 16 2	2114
	Fomalhaut	E.	37 17 14	3860	36 3 14	4012	34 51 46	4187	33 43 8	4393
	α Arietis	E.	90 59 44	2190	89 11 2	2179	87 22 3	2169	85 32 48	2159
10	JUPITER	W.	78 0 50	2094	79 51 59	2087	81 43 19	2081	83 34 48	2075
	Antares	W.	71 26 32	2096	73 17 38	2089	75 8 54	2083	77 0 20	2077
	SATURN	W.	50 31 34	2073	52 23 17	2065	54 15 11	2059	56 7 14	2054
	Fomalhaut	E.	28 55 39	6188	28 12 20	6807	27 34 47	7593	27 3 27	8640
	α Arietis	E.	76 23 4	2118	74 32 33	2112	72 41 51	2107	70 51 3	2103
	Aldebaran	E.	109 25 47	2103	107 34 52	2096	105 43 46	2089	103 52 30	2084
11	JUPITER	W.	92 53 50	2061	94 45 50	2059	96 37 53	2058	98 29 57	2059
	Antares	W.	86 19 14	2061	88 11 14	2059	90 3 16	2059	91 55 18	2059
	SATURN	W.	65 29 7	2037	67 21 43	2035	69 14 21	2035	71 6 59	2037
	α Aquilæ	W.	40 11 21	3253	41 36 28	3164	43 3 20	3087	44 31 45	3020
	α Arietis	E.	61 35 45	2094	59 44 36	2094	57 53 27	2096	56 2 21	2098
	Aldebaran	E.	94 34 25	2066	92 42 34	2066	90 50 42	2065	88 58 49	2065
	VENUS	E.	126 23 17	2180	124 34 20	2180	122 45 22	2180	120 56 24	2180
12	JUPITER	W.	107 49 46	2070	109 41 31	2074	111 33 10	2079	113 24 42	2084
	SATURN	W.	80 29 42	2048	82 22 2	2052	84 14 16	2056	86 6 23	2061
	α Aquilæ	W.	52 11 49	2788	53 46 33	2757	55 21 57	2731	56 57 55	2708
	α Arietis	E.	46 48 15	2125	44 57 54	2134	43 7 46	2145	41 17 55	2155
	Aldebaran	E.	79 39 47	2076	77 48 11	2081	75 56 42	2086	74 5 20	2091
	VENUS	E.	111 52 11	2194	110 3 35	2199	108 15 7	2204	106 26 46	2210
	Pollux	E.	121 28 41	2148	119 38 55	2149	117 49 11	2151	115 59 30	2153
13	SATURN	W.	95 24 45	2095	97 15 52	2104	99 6 45	2113	100 57 25	2121
	Aldebaran	E.	64 50 58	2128	63 0 41	2137	61 10 38	2147	59 20 50	2157
	VENUS	E.	97 27 36	2250	95 40 22	2260	93 53 23	2269	92 6 38	2279
	Pollux	E.	106 52 23	2178	105 3 22	2185	103 14 32	2192	101 25 53	2201
14	SATURN	W.	110 7 4	2174	111 56 11	2185	113 45 1	2196	115 33 34	2208
	Fomalhaut	W.	51 53 37	2979	53 24 16	2954	54 55 27	2932	56 27 5	2914
	Aldebaran	E.	50 15 56	2216	48 27 52	2229	46 40 7	2243	44 52 43	2257
	VENUS	E.	83 16 53	2337	81 31 48	2350	79 47 2	2363	78 2 34	2375
	Pollux	E.	92 26 3	2250	90 38 50	2262	88 51 55	2274	87 5 17	2285
	SUN	E.	122 39 38	2502	120 58 27	2513	119 17 31	2525	117 36 52	2537
15	SATURN	W.	124 31 42	2272	126 18 23	2285	128 4 44	2299	129 50 45	2311
	Fomalhaut	W.	64 9 43	2866	65 42 45	2863	67 15 51	2862	68 48 59	2862
	Aldebaran	E.	36 1 19	2339	34 16 16	2357	32 31 40	2378	30 47 34	2400
	VENUS	E.	69 25 5	2446	67 42 36	2460	66 0 27	2475	64 18 38	2489
	Pollux	E.	78 16 43	2352	76 31 59	2366	74 47 36	2380	73 3 33	2396
	SUN	E.	109 18 0	2602	107 39 8	2616	106 0 36	2630	104 22 22	2643
16	Fomalhaut	W.	76 34 0	2883	78 6 41	2890	79 39 13	2898	81 11 35	2907
	VENUS	E.	55 54 48	2565	54 15 5	2580	52 35 43	2595	50 56 41	2610
	Pollux	E.	64 28 43	2473	62 46 52	2489	61 5 23	2505	59 24 17	2522
	SUN	E.	96 16 0	2716	94 39 42	2731	93 3 43	2745	91 28 3	2760

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
17	Fomalhaut	W.	82 43 45	2916	84 15 43	2927	85 47 27	2939	87 18 57	2950
	Venus	E.	49 17 59	2625	47 39 38	2640	46 1 38	2655	44 23 57	2670
	Pollux	E.	57 43 35	2540	56 3 17	2557	54 23 23	2574	52 43 53	2593
	Sun	E.	89 52 43	2775	88 17 42	2788	86 42 59	2803	85 8 36	2818
18	α Arietis	W.	32 47 52	2663	34 25 22	2667	36 2 46	2671	37 40 5	2675
	Venus	E.	36 20 37	2744	34 44 55	2759	33 9 33	2773	31 34 30	2788
	Pollux	E.	44 32 53	2692	42 56 3	2715	41 19 43	2738	39 43 53	2762
	Sun	E.	77 21 18	2889	75 48 45	2903	74 16 30	2917	72 44 32	2931
19	α Arietis	W.	45 44 40	2710	47 21 6	2719	48 57 21	2727	50 33 25	2735
	Sun	E.	65 9 0	2997	63 38 43	3009	62 8 42	3023	60 38 58	3036
20	α Arietis	W.	58 30 59	2778	60 5 56	2787	61 40 41	2795	63 15 15	2804
	Aldebaran	W.	25 30 53	2830	27 4 41	2830	28 38 28	2831	30 12 16	2832
	Sun	E.	53 14 7	3097	51 45 54	3109	50 17 55	3121	48 50 11	3133
21	α Arietis	W.	71 5 22	2846	72 38 50	2854	74 12 8	2862	75 45 16	2869
	Aldebaran	W.	38 0 11	2856	39 33 26	2861	41 6 36	2867	42 39 37	2873
	Sun	E.	41 35 7	3193	40 8 49	3204	38 42 45	3216	37 16 55	3228
22	Aldebaran	W.	50 22 44	2905	51 54 57	2910	53 27 3	2917	54 59 0	2924
	Mars	W.	21 14 39	3144	22 41 55	3148	24 9 6	3153	25 36 12	3157
	Sun	E.	30 11 29	3294	28 47 11	3309	27 23 10	3325	25 59 28	3343
26	Sun	W.	15 31 44	3645	16 49 30	3620	18 7 43	3596	19 26 23	3578
	Spica	E.	34 59 23	3060	33 30 24	3063	32 1 29	3066	30 32 38	3069
	Jupiter	E.	74 48 56	3086	73 20 29	3089	71 52 6	3092	70 23 47	3095
27	Sun	W.	26 3 18	3530	27 23 10	3525	28 43 8	3521	30 3 10	3517
	Jupiter	E.	63 3 4	3108	61 35 4	3109	60 7 6	3110	58 39 9	3112
	Saturn	E.	89 8 7	3073	87 39 24	3074	86 10 43	3075	84 42 3	3077
28	Sun	W.	36 44 20	3499	38 4 45	3496	39 25 14	3492	40 45 47	3489
	Jupiter	E.	51 19 43	3114	49 51 51	3114	48 23 59	3113	46 56 6	3112
	Antares	E.	56 58 7	3102	55 30 0	3103	54 1 54	3103	52 33 48	3102
	Saturn	E.	77 19 2	3079	75 50 27	3078	74 21 51	3077	72 53 14	3076
29	Sun	W.	47 29 30	3470	48 50 28	3465	50 11 31	3460	51 32 40	3455
	Jupiter	E.	39 36 13	3102	38 8 6	3100	36 39 56	3096	35 11 42	3092
	Antares	E.	45 13 8	3098	43 44 56	3097	42 16 43	3096	40 48 28	3094
	Saturn	E.	65 29 41	3067	64 0 51	3063	62 31 56	3060	61 2 57	3056
30	Sun	W.	58 19 57	3424	59 41 46	3416	61 3 44	3409	62 25 50	3400
	Jupiter	E.	27 49 15	3068	26 20 27	3063	24 51 33	3057	23 22 31	3050
	Antares	E.	33 26 36	3084	31 58 7	3083	30 29 37	3081	29 1 4	3080
	Saturn	E.	53 36 46	3032	52 7 13	3026	50 37 33	3019	49 7 44	3013
31	Sun	W.	69 18 48	3355	70 41 56	3344	72 5 17	3333	73 28 50	3321
	Spica	W.	24 26 7	2979	25 56 46	2969	27 27 37	2959	28 58 41	2948
	Saturn	E.	41 36 24	2973	40 5 37	2964	38 34 39	2954	37 3 28	2944
	Fomalhaut	E.	103 52 45	3471	102 31 48	3455	101 10 33	3440	99 49 2	3426

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
17	Fomalhaut	W.	88 50 12	2963	90 21 11	2976	91 51 54	2990	93 22 19	3005
	Venus	E.	42 46 37	2685	41 9 37	2701	39 32 58	2715	37 56 38	2729
	Pollux	E.	51 4 49	2612	49 26 10	2632	47 47 58	2651	46 10 12	2671
	Sun	E.	83 34 31	2832	82 0 45	2847	80 27 18	2861	78 54 9	2875
18	α Arietis	W.	39 17 18	2681	40 54 22	2688	42 31 17	2695	44 8 4	2703
	Venus	E.	29 59 46	2802	28 25 21	2817	26 51 15	2831	25 17 28	2845
	Pollux	E.	38 8 35	2788	36 33 51	2816	34 59 44	2845	33 26 15	2876
	Sun	E.	71 12 52	2944	69 41 29	2958	68 10 23	2970	66 39 33	2984
19	α Arietis	W.	52 9 18	2743	53 45 1	2752	55 20 32	2761	56 55 51	2769
	Sun	E.	59 9 30	3047	57 40 16	3060	56 11 18	3073	54 42 35	3085
20	α Arietis	W.	64 49 38	2812	66 23 50	2820	67 57 52	2829	69 31 42	2837
	Aldebaran	W.	31 46 3	2836	33 19 43	2840	34 53 19	2845	36 26 48	2850
	Sun	E.	47 22 42	3145	45 55 27	3157	44 28 26	3169	43 1 39	3181
21	α Arietis	W.	77 18 14	2878	78 51 1	2886	80 23 38	2893	81 56 6	2902
	Aldebaran	W.	44 12 30	2880	45 45 15	2886	47 17 53	2892	48 50 22	2898
	Sun	E.	35 51 19	3241	34 25 58	3254	33 0 53	3267	31 36 3	3281
22	Aldebaran	W.	56 30 49	2930	58 2 30	2936	59 34 3	2942	61 5 28	2948
	Mars	W.	27 3 13	3162	28 30 8	3167	29 56 57	3173	31 23 39	3178
	Sun	E.	24 36 6	3359	23 13 3	3379	21 50 23	3405	20 28 12	3431
26	Sun	W.	20 45 21	3565	22 4 33	3554	23 23 59	3545	24 43 34	3536
	Spica	E.	29 3 51	3073	27 35 9	3076	26 6 30	3079	24 37 55	3082
	Jupiter	E.	68 55 32	3098	67 27 20	3101	65 59 12	3103	64 31 7	3105
27	Sun	W.	31 23 15	3512	32 43 26	3509	34 3 41	3506	35 23 59	3503
	Jupiter	E.	57 11 14	3113	55 43 20	3114	54 15 28	3114	52 47 35	3114
	Saturn	E.	83 13 25	3078	81 44 48	3079	80 16 13	3079	78 47 37	3079
28	Sun	W.	42 6 23	3486	43 27 3	3482	44 47 48	3478	46 8 37	3474
	Jupiter	E.	45 28 11	3111	44 0 15	3109	42 32 17	3107	41 4 16	3105
	Antares	E.	51 5 41	3102	49 37 34	3102	48 9 27	3101	46 41 18	3100
	Saturn	E.	71 24 35	3075	69 55 55	3073	68 27 13	3071	66 58 28	3069
29	Sun	W.	52 53 54	3449	54 15 15	3444	55 36 42	3438	56 58 16	3431
	Jupiter	E.	33 43 23	3088	32 14 59	3084	30 46 31	3079	29 17 57	3073
	Antares	E.	39 20 10	3091	37 51 50	3090	36 23 28	3088	34 55 3	3086
	Saturn	E.	59 33 54	3052	58 4 46	3047	56 35 32	3043	55 6 12	3038
30	Sun	W.	63 48 6	3393	65 10 31	3384	66 33 6	3375	67 55 51	3365
	Jupiter	E.	21 53 20	3043	20 24 1	3037	18 54 34	3029	17 24 57	3021
	Antares	E.	27 32 30	3081	26 3 57	3082	24 35 25	3083	23 6 54	3084
	Saturn	E.	47 37 47	3005	46 7 41	2998	44 37 26	2989	43 7 0	2981
31	Sun	W.	74 52 37	3310	76 16 37	3298	77 40 51	3286	79 5 19	3273
	Spica	W.	30 29 59	2938	32 1 30	2926	33 33 16	2914	35 5 17	2901
	Saturn	E.	35 32 5	2934	34 0 29	2923	32 28 39	2912	30 56 35	2900
	Fomalhaut	E.	98 27 15	3411	97 5 11	3397	95 42 51	3383	94 20 15	3369

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	10 40 46.13	9.076	N. 8 21 45.2	−54.38	15 52.37	64.33	0 0.22	0.781
SUN.	2	10 44 23.75	9.063	7 59 56.5	54.70	15 52.60	64.29	0 19.13	0.794
Mon.	3	10 48 1.05	9.051	7 38 0.1	55.01	15 52.83	64.25	0 38.32	0.806
Tues.	4	10 51 38.07	9.039	7 15 56.5	−55.31	15 53.07	64.21	0 57.80	0.817
Wed.	5	10 55 14.83	9.028	6 53 45.7	55.60	15 53.31	64.18	1 17.54	0.828
Thur.	6	10 58 51.33	9.019	6 31 28.3	55.87	15 53.55	64.15	1 37.54	0.838
Frid.	7	11 2 27.62	9.010	6 9 4.5	−56.13	15 53.79	64.12	1 57.74	0.847
Sat.	8	11 6 3.70	9.002	5 46 34.5	56.38	15 54.03	64.09	2 18.16	0.855
SUN.	9	11 9 39.59	8.995	5 23 58.9	56.62	15 54.28	64.06	2 38.76	0.862
Mon.	10	11 13 15.33	8.989	5 1 17.7	−56.84	15 54.53	64.04	2 59.51	0.868
Tues.	11	11 16 50.94	8.984	4 38 31.3	57.05	15 54.78	64.02	3 20.39	0.873
Wed.	12	11 20 26.44	8.980	4 15 40.0	57.24	15 55.03	64.00	3 41.39	0.877
Thur.	13	11 24 1.86	8.977	3 52 44.1	−57.42	15 55.28	63.99	4 2.46	0.880
Frid.	14	11 27 37.22	8.974	3 29 43.9	57.60	15 55.54	63.98	4 23.61	0.882
Sat.	15	11 31 12.54	8.973	3 6 39.9	57.76	15 55.80	63.97	4 44.78	0.883
SUN.	16	11 34 47.82	8.973	2 43 32.1	−57.90	15 56.06	63.97	5 5.99	0.884
Mon.	17	11 38 23.11	8.973	2 20 21.2	58.03	15 56.32	63.97	5 27.19	0.884
Tues.	18	11 41 58.41	8.974	1 57 7.2	58.15	15 56.58	63.97	5 48.38	0.882
Wed.	19	11 45 33.76	8.976	1 33 50.8	−58.25	15 56.84	63.97	6 9.53	0.880
Thur.	20	11 49 9.14	8.979	1 10 32.1	58.33	15 57.10	63.98	6 30.63	0.878
Frid.	21	11 52 44.61	8.982	0 47 11.6	58.40	15 57.37	63.99	6 51.67	0.875
Sat.	22	11 56 20.16	8.986	0 23 49.6	−58.46	15 57.64	64.00	7 12.61	0.871
SUN.	23	11 59 55.82	8.991	N. 0 0 26.4	58.50	15 57.91	64.02	7 33.45	0.866
Mon.	24	12 3 31.60	8.996	S. 0 22 57.5	58.52	15 58.18	64.04	7 54.17	0.861
Tues.	25	12 7 7.53	9.002	0 46 22.0	−58.53	15 58.45	64.06	8 14.73	0.855
Wed.	26	12 10 43.60	9.009	1 9 46.4	58.53	15 58.72	64.08	8 35.15	0.848
Thur.	27	12 14 19.86	9.017	1 33 10.5	58.51	15 58.99	64.11	8 55.39	0.840
Frid.	28	12 17 56.30	9.025	1 56 34.1	−58.47	15 59.27	64.14	9 15.44	0.831
Sat.	29	12 21 32.98	9.034	2 19 56.6	58.42	15 59.55	64.18	9 35.27	0.822
SUN.	30	12 25 9.87	9.044	2 43 17.7	58.36	15 59.82	64.22	9 54.87	0.812
Mon.	31	12 28 47.01	9.055	S. 3 6 37.0	−58.28	16 0.10	64.26	10 14.24	0.801

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^{s}.18$ from the sidereal time.
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	10 40 46.13	9.076	N. 8 21 45.2	−54.38	0 0.23	0.781	10 40 46.36
SUN.	2	10 44 23.79	9.063	7 59 56.2	54.70	0 19.13	0.794	10 44 42.92
Mon.	3	10 48 1.14	9.051	7 37 59.5	55.01	0 38.33	0.806	10 48 39.47
Tues.	4	10 51 38.21	9.039	7 15 55.6	−55.31	0 57.81	0.817	10 52 36.02
Wed.	5	10 55 15.02	9.028	6 53 44.5	55.60	1 17.56	0.828	10 56 32.58
Thur.	6	10 58 51.57	9.019	6 31 26.8	55.87	1 37.56	0.838	11 0 29.13
Frid.	7	11 2 27.91	9.010	6 9 2.7	−56.13	1 57.77	0.847	11 4 25.68
Sat.	8	11 6 4.04	9.002	5 46 32.4	56.38	2 18.19	0.855	11 8 22.23
SUN.	9	11 9 39.99	8.995	5 23 56.4	56.62	2 38.80	0.862	11 12 18.79
Mon.	10	11 13 15.79	8.989	5 1 14.9	−56.84	2 59.55	0.868	11 16 15.34
Tues.	11	11 16 51.45	8.984	4 38 28.1	57.05	3 20.44	0.873	11 20 11.89
Wed.	12	11 20 27.00	8.980	4 15 36.5	57.24	3 41.44	0.877	11 24 8.44
Thur.	13	11 24 2.47	8.977	3 52 40.2	−57.42	4 2.52	0.880	11 28 5.00
Frid.	14	11 27 37.88	8.974	3 29 39.7	57.60	4 23.67	0.882	11 32 1.55
Sat.	15	11 31 13.25	8.973	3 6 35.3	57.76	4 44.85	0.883	11 35 58.10
SUN.	16	11 34 48.59	8.973	2 43 27.2	−57.90	5 6.06	0.884	11 39 54.65
Mon.	17	11 38 23.93	8.973	2 20 15.9	58.03	5 27.27	0.884	11 43 51.21
Tues.	18	11 41 59.29	8.974	1 57 1.6	58.15	5 48.47	0.882	11 47 47.76
Wed.	19	11 45 34.69	8.976	1 33 44.8	−58.25	6 9.62	0.880	11 51 44.31
Thur.	20	11 49 10.13	8.979	1 10 25.8	58.33	6 30.73	0.878	11 55 40.86
Frid.	21	11 52 45.65	8.982	0 47 4.9	58.40	6 51.77	0.875	11 59 37.42
Sat.	22	11 56 21.25	8.986	0 23 42.6	−58.46	7 12.72	0.871	12 3 33.97
SUN.	23	11 59 56.96	8.991	N. 0 0 19.0	58.50	7 33.56	0.866	12 7 30.52
Mon.	24	12 3 32.79	8.996	S. 0 23 5.2	58.52	7 54.28	0.861	12 11 27.07
Tues.	25	12 7 8.77	9.002	0 46 30.0	−58.53	8 14.85	0.855	12 15 23.62
Wed.	26	12 10 44.90	9.009	1 9 54.8	58.53	8 35.27	0.848	12 19 20.18
Thur.	27	12 14 21.21	9.017	1 33 19.2	58.51	8 55.52	0.840	12 23 16.73
Frid.	28	12 17 57.71	9.025	1 56 43.1	−58.47	9 15.57	0.831	12 27 13.28
Sat.	29	12 21 34.43	9.034	2 20 5.9	58.42	9 35.40	0.822	12 31 9.83
SUN.	30	12 25 11.37	9.044	2 43 27.3	58.36	9 55.01	0.812	12 35 6.39
Mon.	31	12 28 48.56	9.055	S. 3 6 46.9	−58.28	10 14.38	0.801	12 39 2.94

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations, increasing.

Diff. for 1 Hour, $+9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S TRUE LONGITUDE. λ	THE SUN'S TRUE LONGITUDE. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	244	158 34 13.5	33 23.3	145.25	− 0.18	0.0038298	−44.4	13 17 2.70
2	245	159 32 20.2	31 29.9	145.31	− 0.06	0.0037217	44.9	13 13 6.80
3	246	160 30 28.3	29 37.9	145.37	+ 0.07	0.0036125	45.4	13 9 10.89
4	247	161 28 37.8	27 47.3	145.43	+ 0.20	0.0035024	−45.9	13 5 14.98
5	248	162 26 48.7	25 58.2	145.49	0.28	0.0033914	46.3	13 1 19.07
6	249	163 25 1.2	24 10.6	145.55	0.35	0.0032799	46.6	12 57 23.17
7	250	164 23 15.3	22 24.5	145.62	+ 0.40	0.0031678	−46.8	12 53 27.26
8	251	165 21 31.0	20 40.1	145.69	0.42	0.0030554	46.9	12 49 31.35
9	252	166 19 48.4	18 57.5	145.77	0.40	0.0029427	47.0	12 45 35.45
10	253	167 18 7.8	17 16.7	145.85	+ 0.35	0.0028297	−47.1	12 41 39.54
11	254	168 16 29.0	15 37.9	145.93	0.27	0.0027166	47.2	12 37 43.64
12	255	169 14 52.3	14 1.0	146.01	0.15	0.0026032	47.3	12 33 47.73
13	256	170 13 17.6	12 26.3	146.10	+ 0.03	0.0024894	−47.5	12 29 51.82
14	257	171 11 45.2	10 53.7	146.19	− 0.10	0.0023751	47.7	12 25 55.91
15	258	172 10 14.9	9 23.4	146.28	0.23	0.0022603	48.0	12 22 0.01
16	259	173 8 46.8	7 55.2	146.37	− 0.35	0.0021448	−48.3	12 18 4.10
17	260	174 7 20.9	6 29.2	146.46	0.47	0.0020285	48.6	12 14 8.19
18	261	175 5 57.2	5 5.5	146.56	0.56	0.0019114	49.0	12 10 12.29
19	262	176 4 35.8	3 43.9	146.65	− 0.63	0.0017934	−49.4	12 6 16.38
20	263	177 3 16.5	2 24.6	146.74	0.68	0.0016743	49.8	12 2 20.48
21	264	178 1 59.3	1 7.3	146.83	0.70	0.0015543	50.2	11 58 24.57
22	265	178 60 44.2	59 52.0	146.91	− 0.70	0.0014332	−50.6	11 54 28.66
23	266	179 59 31.0	58 38.8	147.00	0.66	0.0013112	51.0	11 50 32.76
24	267	180 58 20.0	57 27.7	147.08	0.61	0.0011882	51.4	11 46 36.85
25	268	181 57 10.9	56 18.5	147.16	− 0.53	0.0010642	−51.8	11 42 40.94
26	269	182 56 3.7	55 11.3	147.24	0.44	0.0009394	52.1	11 38 45.04
27	270	183 54 58.4	54 5.9	147.32	0.33	0.0008137	52.4	11 34 49.13
28	271	184 53 55.0	53 2.4	147.39	− 0.21	0.0006872	−52.7	11 30 53.22
29	272	185 52 53.4	52 0.7	147.47	− 0.08	0.0005603	53.0	11 26 57.32
30	273	186 51 53.6	51 0.8	147.54	+ 0.04	0.0004328	53.2	11 23 1.41
31	274	187 50 55.5	50 2.6	147.62	+ 0.17	0.0003049	−53.3	11 19 5.50

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 6.9	15 12.4	55 21.7	+1.60	55 42.0	+1.79	5 16.7	2.10	7.3
2	15 18.6	15 25.2	56 4.6	1.95	56 29.0	2.11	6 8.4	2.20	8.3
3	15 32.4	15 39.9	56 55.2	2.24	57 22.8	2.34	7 2.1	2.27	9.3
4	15 47.7	15 55.6	57 51.4	+2.40	58 20.5	+2.42	7 57.2	2.31	10.3
5	16 3.5	16 11.2	58 49.5	2.39	59 17.9	2.30	8 52.8	2.32	11.3
6	16 18.6	16 25.4	59 44.9	2.16	60 9.9	1.96	9 48.2	2.30	12.3
7	16 31.4	16 36.5	60 32.0	+1.70	60 50.7	+1.38	10 43.2	2.28	13.3
8	16 40.5	16 43.2	61 5.3	1.03	61 15.4	+0.63	11 37.8	2.27	14.3
9	16 44.6	16 44.7	61 20.6	+0.22	61 20.7	−0.19	12 32.5	2.29	15.3
10	16 43.4	16 40.8	61 16.0	−0.59	61 6.5	−0.97	13 27.8	2.32	16.3
11	16 37.0	16 32.2	60 52.6	1.31	60 35.0	1.60	14 24.0	2.36	17.3
12	16 26.5	16 20.2	60 14.1	1.84	59 50.8	2.02	15 21.1	2.39	18.3
13	16 13.3	16 6.1	59 25.6	−2.15	58 59.2	−2.22	16 18.5	2.39	19.3
14	15 58.8	15 51.5	58 32.3	2.24	58 5.3	2.23	17 15.4	2.34	20.3
15	15 44.3	15 37.3	57 38.9	2.17	57 13.2	2.09	18 10.6	2.26	21.3
16	15 30.6	15 24.3	56 48.8	−1.98	56 25.7	−1.85	19 3.4	2.14	22.3
17	15 18.5	15 13.1	56 4.3	1.72	55 44.5	1.58	19 53.3	2.02	23.3
18	15 8.2	15 3.8	55 26.4	1.43	55 10.1	1.28	20 40.5	1.91	24.3
19	14 59.8	14 56.3	54 55.6	−1.14	54 42.8	−1.00	21 25.2	1.82	25.3
20	14 53.3	14 50.7	54 31.6	0.86	54 22.1	0.73	22 8.0	1.76	26.3
21	14 48.5	14 46.7	54 14.0	0.60	54 7.5	0.49	22 49.7	1.72	27.3
22	14 45.3	14 44.3	54 2.3	−0.37	53 58.6	−0.26	23 31.0	1.72	28.3
23	14 43.6	14 43.3	53 56.1	−0.15	53 55.0	−0.03	☌		29.3
24	14 43.4	14 43.8	53 55.2	+0.07	53 56.8	+0.18	0 12.5	1.74	0.7
25	14 44.6	14 45.8	53 59.7	+0.30	54 4.1	+0.43	0 55.0	1.80	1.7
26	14 47.4	14 49.4	54 10.0	0.55	54 17.4	0.69	1 38.9	1.87	2.7
27	14 51.9	14 54.8	54 26.5	0.83	54 37.3	0.98	2 24.7	1.95	3.7
28	14 58.3	15 2.2	54 49.9	+1.13	55 4.3	+1.28	3 12.6	2.04	4.7
29	15 6.6	15 11.6	55 20.6	1.44	55 38.9	1.60	4 2.6	2.12	5.7
30	15 17.1	15 23.1	55 59.0	1.75	56 21.0	1.90	4 54.3	2.18	6.7
31	15 29.5	15 36.3	56 44.6	+2.04	57 9.8	+2.15	5 47.2	2.22	7.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 1.					MONDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 46 48.47	2.1758	S.20 33 26.8	4.086	0	17 35 26.23	2.3378	S.21 44 40.4	1.334
1	15 48 59.14	2.1798	20 37 29.0	3.987	1	17 37 46.57	2.3403	21 43 16.6	1.459
2	15 51 10.05	2.1838	20 41 25.2	3.888	2	17 40 7.06	2.3427	21 41 45.3	1.585
3	15 53 21.19	2.1877	20 45 15.5	3.788	3	17 42 27.69	2.3449	21 40 6.4	1.711
4	15 55 32.57	2.1917	20 48 59.8	3.688	4	17 44 48.45	2.3472	21 38 20.0	1.836
5	15 57 44.19	2.1956	20 52 38.0	3.586	5	17 47 9.35	2.3494	21 36 26.1	1.962
6	15 59 56.04	2.1995	20 56 10.1	3.484	6	17 49 30.38	2.3516	21 34 24.6	2.088
7	16 2 8.13	2.2034	20 59 36.1	3.382	7	17 51 51.54	2.3537	21 32 15.5	2.215
8	16 4 20.45	2.2073	21 2 56.0	3.278	8	17 54 12.82	2.3557	21 29 58.8	2.342
9	16 6 33.00	2.2111	21 6 9.6	3.174	9	17 56 34.22	2.3577	21 27 34.5	2.469
10	16 8 45.78	2.2149	21 9 16.9	3.069	10	17 58 55.74	2.3597	21 25 2.5	2.597
11	16 10 58.79	2.2188	21 12 17.9	2.964	11	18 1 17.38	2.3616	21 22 22.9	2.723
12	16 13 12.03	2.2226	21 15 12.6	2.858	12	18 3 39.13	2.3634	21 19 35.7	2.851
13	16 15 25.50	2.2264	21 18 0.9	2.752	13	18 6 0.99	2.3652	21 16 40.8	2.979
14	16 17 39.20	2.2302	21 20 42.8	2.645	14	18 8 22.95	2.3668	21 13 38.2	3.108
15	16 19 53.12	2.2338	21 23 18.3	2.538	15	18 10 45.01	2.3685	21 10 27.9	3.236
16	16 22 7.26	2.2376	21 25 47.3	2.429	16	18 13 7.17	2.3702	21 7 9.9	3.364
17	16 24 21.63	2.2413	21 28 9.8	2.320	17	18 15 29.43	2.3718	21 3 44.2	3.492
18	16 26 36.22	2.2450	21 30 25.7	2.210	18	18 17 51.78	2.3733	21 0 10.9	3.620
19	16 28 51.03	2.2486	21 32 35.0	2.099	19	18 20 14.22	2.3748	20 56 29.8	3.749
20	16 31 6.05	2.2522	21 34 37.6	1.988	20	18 22 36.75	2.3762	20 52 41.0	3.878
21	16 33 21.29	2.2558	21 36 33.6	1.877	21	18 24 59.36	2.3775	20 48 44.5	4.005
22	16 35 36.74	2.2593	21 38 22.8	1.764	22	18 27 22.05	2.3788	20 44 40.4	4.133
23	16 37 52.40	2.2628	S.21 40 5.3	1.652	23	18 29 44.81	2.3800	S.20 40 28.5	4.263
	SUNDAY 2.					TUESDAY 4.			
0	16 40 8.28	2.2663	S.21 41 41.0	1.538	0	18 32 7.65	2.3812	S.20 36 8.9	4.391
1	16 42 24.36	2.2698	21 43 9.9	1.424	1	18 34 30.56	2.3823	20 31 41.6	4.519
2	16 44 40.65	2.2732	21 44 31.9	1.310	2	18 36 53.53	2.3834	20 27 6.6	4.647
3	16 46 57.14	2.2765	21 45 47.1	1.196	3	18 39 16.57	2.3845	20 22 24.0	4.775
4	16 49 13.83	2.2798	21 46 55.4	1.080	4	18 41 39.67	2.3854	20 17 33.6	4.904
5	16 51 30.72	2.2832	21 47 56.7	0.963	5	18 44 2.82	2.3863	20 12 35.5	5.032
6	16 53 47.81	2.2864	21 48 51.0	0.847	6	18 46 26.03	2.3873	20 7 29.8	5.159
7	16 56 5.09	2.2897	21 49 38.3	0.729	7	18 48 49.29	2.3881	20 2 16.4	5.288
8	16 58 22.57	2.2929	21 50 18.5	0.612	8	18 51 12.60	2.3888	19 56 55.3	5.415
9	17 0 40.24	2.2960	21 50 51.7	0.494	9	18 53 35.95	2.3896	19 51 26.6	5.542
10	17 2 58.09	2.2991	21 51 17.8	0.375	10	18 55 59.35	2.3903	19 45 50.3	5.669
11	17 5 16.13	2.3021	21 51 36.7	0.255	11	18 58 22.79	2.3909	19 40 6.3	5.797
12	17 7 34.34	2.3051	21 51 48.4	0.136	12	19 0 46.26	2.3915	19 34 14.7	5.923
13	17 9 52.74	2.3082	21 51 53.0	− 0.016	13	19 3 9.77	2.3920	19 28 15.5	6.049
14	17 12 11.32	2.3111	21 51 50.3	+ 0.106	14	19 5 33.30	2.3925	19 22 8.8	6.175
15	17 14 30.07	2.3139	21 51 40.3	0.227	15	19 7 56.87	2.3930	19 15 54.5	6.302
16	17 16 48.99	2.3168	21 51 23.1	0.348	16	19 10 20.46	2.3933	19 9 32.6	6.428
17	17 19 8.08	2.3196	21 50 58.6	0.470	17	19 12 44.07	2.3937	19 3 3.2	6.552
18	17 21 27.34	2.3224	21 50 26.7	0.592	18	19 15 7.70	2.3940	18 56 26.4	6.676
19	17 23 46.77	2.3251	21 49 47.5	0.714	19	19 17 31.35	2.3943	18 49 42.1	6.801
20	17 26 6.35	2.3277	21 49 1.0	0.838	20	19 19 55.01	2.3945	18 42 50.3	6.925
21	17 28 26.09	2.3303	21 48 7.0	0.962	21	19 22 18.69	2.3947	18 35 51.1	7.048
22	17 30 45.99	2.3329	21 47 5.6	1.086	22	19 24 42.37	2.3948	18 28 44.5	7.172
23	17 33 6.04	2.3353	21 45 56.7	1.210	23	19 27 6.06	2.3948	18 21 30.5	7.294
24	17 35 26.23	2.3378	S.21 44 40.4	1.334	24	19 29 29.75	2.3949	S.18 14 9.2	7.416

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 5.					FRIDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	19 29 29.75	2.3949	S. 18 14 9.2	7.416	0	21 23 58.81	2.3694	S. 10 11 16.2	12.333
1	19 31 53.45	2.3949	18 6 40.6	7.538	1	21 26 20.96	2.3688	9 58 53.9	12.408
2	19 34 17.14	2.3948	17 59 4.6	7.660	2	21 28 43.06	2.3680	9 46 27.2	12.482
3	19 36 40.83	2.3948	17 51 21.4	7.780	3	21 31 5.12	2.3674	9 33 56.1	12.554
4	19 39 4.52	2.3948	17 43 31.0	7.900	4	21 33 27.15	2.3668	9 21 20.7	12.625
5	19 41 28.20	2.3946	17 35 33.4	8.020	5	21 35 49.14	2.3662	9 8 41.1	12.694
6	19 43 51.87	2.3944	17 27 28.6	8.139	6	21 38 11.09	2.3655	8 55 57.4	12.763
7	19 46 15.53	2.3943	17 19 16.7	8.257	7	21 40 33.00	2.3649	8 43 9.6	12.829
8	19 48 39.18	2.3940	17 10 57.8	8.374	8	21 42 54.88	2.3643	8 30 17.9	12.894
9	19 51 2.81	2.3937	17 2 31.8	8.491	9	21 45 16.72	2.3637	8 17 22.3	12.957
10	19 53 26.42	2.3934	16 53 58.9	8.607	10	21 47 38.52	2.3631	8 4 23.0	13.019
11	19 55 50.02	2.3932	16 45 19.0	8.723	11	21 50 0.29	2.3626	7 51 20.0	13.081
12	19 58 13.60	2.3928	16 36 32.1	8.838	12	21 52 22.03	2.3621	7 38 13.3	13.140
13	20 0 37.15	2.3923	16 27 38.4	8.952	13	21 54 43.74	2.3616	7 25 3.2	13.197
14	20 3 0.68	2.3919	16 18 37.9	9.065	14	21 57 5.42	2.3611	7 11 49.7	13.253
15	20 5 24.18	2.3915	16 9 30.6	9.178	15	21 59 27.07	2.3606	6 58 32.9	13.307
16	20 7 47.66	2.3911	16 0 16.5	9.290	16	22 1 48.69	2.3602	6 45 12.8	13.360
17	20 10 11.11	2.3905	15 50 55.8	9.400	17	22 4 10.29	2.3598	6 31 49.7	13.411
18	20 12 34.52	2.3900	15 41 28.5	9.510	18	22 6 31.86	2.3593	6 18 23.5	13.461
19	20 14 57.91	2.3895	15 31 54.6	9.620	19	22 8 53.41	2.3590	6 4 54.4	13.508
20	20 17 21.26	2.3889	15 22 14.1	9.728	20	22 11 14.94	2.3587	5 51 22.5	13.555
21	20 19 44.58	2.3884	15 12 27.2	9.835	21	22 13 36.45	2.3583	5 37 47.8	13.600
22	20 22 7.87	2.3878	15 2 33.9	9.942	22	22 15 57.93	2.3579	5 24 10.5	13.643
23	20 24 31.12	2.3872	S. 14 52 34.2	10.048	23	22 18 19.40	2.3577	S. 5 10 30.7	13.684
	THURSDAY 6.					SATURDAY 8.			
0	20 26 54.33	2.3866	S. 14 42 28.1	10.153	0	22 20 40.86	2.3575	S. 4 56 48.4	13.724
1	20 29 17.51	2.3859	14 32 15.9	10.256	1	22 23 2.30	2.3573	4 43 3.8	13.762
2	20 31 40.64	2.3853	14 21 57.4	10.359	2	22 25 23.73	2.3571	4 29 17.0	13.798
3	20 34 3.74	2.3846	14 11 32.8	10.460	3	22 27 45.15	2.3569	4 15 28.0	13.833
4	20 36 26.79	2.3838	14 1 2.2	10.561	4	22 30 6.56	2.3568	4 1 37.0	13.866
5	20 38 49.80	2.3832	13 50 25.5	10.661	5	22 32 27.96	2.3566	3 47 44.1	13.897
6	20 41 12.77	2.3825	13 39 42.9	10.759	6	22 34 49.35	2.3565	3 33 49.4	13.927
7	20 43 35.70	2.3818	13 28 54.4	10.857	7	22 37 10.74	2.3565	3 19 52.9	13.955
8	20 45 58.59	2.3811	13 18 0.0	10.954	8	22 39 32.13	2.3565	3 5 54.8	13.981
9	20 48 21.43	2.3803	13 6 59.9	11.049	9	22 41 53.52	2.3565	2 51 55.2	14.005
10	20 50 44.23	2.3796	12 55 54.1	11.143	10	22 44 14.91	2.3566	2 37 54.2	14.028
11	20 53 6.98	2.3789	12 44 42.7	11.237	11	22 46 36.31	2.3567	2 23 51.8	14.049
12	20 55 29.70	2.3782	12 33 25.7	11.328	12	22 48 57.71	2.3568	2 9 48.3	14.068
13	20 57 52.37	2.3774	12 22 3.3	11.419	13	22 51 19.12	2.3569	1 55 43.7	14.085
14	21 0 14.99	2.3767	12 10 35.4	11.509	14	22 53 40.54	2.3570	1 41 38.0	14.101
15	21 2 37.57	2.3760	11 59 2.2	11.597	15	22 56 1.96	2.3572	1 27 31.5	14.115
16	21 5 0.11	2.3753	11 47 23.8	11.683	16	22 58 23.40	2.3575	1 13 24.2	14.128
17	21 7 22.60	2.3745	11 35 40.2	11.769	17	23 0 44.86	2.3578	0 59 16.2	14.138
18	21 9 45.05	2.3738	11 23 51.5	11.854	18	23 3 6.33	2.3580	0 45 7.7	14.146
19	21 12 7.45	2.3730	11 11 57.7	11.938	19	23 5 27.82	2.3583	0 30 58.7	14.153
20	21 14 29.81	2.3723	10 59 59.0	12.019	20	23 7 49.33	2.3587	0 16 49.4	14.158
21	21 16 52.13	2.3716	10 47 55.3	12.099	21	23 10 10.86	2.3591	S. 0 2 39.8	14.161
22	21 19 14.40	2.3708	10 35 47.0	12.178	22	23 12 32.42	2.3595	N. 0 11 29.9	14.162
23	21 21 36.63	2.3701	10 23 33.9	12.257	23	23 14 54.00	2.3600	0 25 39.6	14.162
24	21 23 58.81	2.3694	S. 10 11 16.2	12.333	24	23 17 15.62	2.3605	N. 0 39 49.3	14.160

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 9.					TUESDAY 11.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 17 15.62	2.3605	N. 0 39 49.3	14.160	0	1 11 39.89	2.4148	N. 11 23 32.0	12.011
1	23 19 37.26	2.3610	0 53 58.8	14.156	1	1 14 4.83	2.4163	11 35 30.1	11.926
2	23 21 58.94	2.3616	1 8 8.0	14.150	2	1 16 29.85	2.4178	11 47 23.1	11.840
3	23 24 20.65	2.3621	1 22 16.8	14.143	3	1 18 54.96	2.4193	11 59 10.9	11.753
4	23 26 42.39	2.3627	1 36 25.1	14.133	4	1 21 20.17	2.4209	12 10 53.5	11.665
5	23 29 4.17	2.3633	1 50 32.8	14.123	5	1 23 45.47	2.4224	12 22 30.7	11.575
6	23 31 25.99	2.3641	2 4 39.8	14.110	6	1 26 10.86	2.4239	12 34 2.5	11.483
7	23 33 47.86	2.3648	2 18 46.0	14.095	7	1 28 36.34	2.4254	12 45 28.7	11.390
8	23 36 9.77	2.3655	2 32 51.2	14.078	8	1 31 1.91	2.4268	12 56 49.3	11.297
9	23 38 31.72	2.3663	2 46 55.4	14.060	9	1 33 27.56	2.4283	13 8 4.3	11.202
10	23 40 53.72	2.3671	3 0 58.4	14.040	10	1 35 53.31	2.4298	13 19 13.5	11.105
11	23 43 15.77	2.3678	3 15 0.2	14.018	11	1 38 19.14	2.4313	13 30 16.9	11.008
12	23 45 37.86	2.3687	3 29 0.6	13.994	12	1 40 45.06	2.4328	13 41 14.4	10.908
13	23 48 0.01	2.3697	3 42 59.5	13.969	13	1 43 11.07	2.4342	13 52 5.9	10.807
14	23 50 22.22	2.3706	3 56 56.9	13.943	14	1 45 37.16	2.4356	14 2 51.3	10.705
15	23 52 44.48	2.3715	4 10 52.6	13.913	15	1 48 3.34	2.4370	14 13 30.5	10.603
16	23 55 6.80	2.3725	4 24 46.5	13.882	16	1 50 29.60	2.4383	14 24 3.6	10.499
17	23 57 29.18	2.3735	4 38 38.4	13.849	17	1 52 55.94	2.4398	14 34 30.4	10.393
18	23 59 51.62	2.3746	4 52 28.4	13.816	18	1 55 22.37	2.4411	14 44 50.8	10.287
19	0 2 14.13	2.3757	5 6 16.3	13.780	19	1 57 48.87	2.4423	14 55 4.8	10.179
20	0 4 36.70	2.3767	5 20 2.0	13.743	20	2 0 15.45	2.4437	15 5 12.3	10.071
21	0 6 59.33	2.3778	5 33 45.4	13.703	21	2 2 42.12	2.4451	15 15 13.3	9.962
22	0 9 22.03	2.3789	5 47 26.3	13.661	22	2 5 8.86	2.4463	15 25 7.7	9.851
23	0 11 44.80	2.3801	N. 6 1 4.7	13.618	23	2 7 35.67	2.4474	N. 15 34 55.4	9.739
MONDAY 10.					WEDNESDAY 12.				
0	0 14 7.64	2.3813	N. 6 14 40.5	13.574	0	2 10 2.55	2.4487	N. 15 44 36.4	9.626
1	0 16 30.55	2.3825	6 28 13.6	13.528	1	2 12 29.51	2.4499	15 54 10.5	9.512
2	0 18 53.54	2.3838	6 41 43.8	13.479	2	2 14 56.54	2.4510	16 3 37.8	9.398
3	0 21 16.60	2.3849	6 55 11.1	13.430	3	2 17 23.63	2.4521	16 12 58.2	9.282
4	0 23 39.73	2.3862	7 8 35.4	13.378	4	2 19 50.79	2.4532	16 22 11.6	9.165
5	0 26 2.94	2.3875	7 21 56.5	13.325	5	2 22 18.01	2.4543	16 31 18.0	9.048
6	0 28 26.23	2.3888	7 35 14.4	13.271	6	2 24 45.30	2.4553	16 40 17.3	8.928
7	0 30 49.60	2.3902	7 48 29.0	13.214	7	2 27 12.65	2.4563	16 49 9.4	8.809
8	0 33 13.05	2.3915	8 1 40.1	13.156	8	2 29 40.05	2.4572	16 57 54.4	8.689
9	0 35 36.58	2.3928	8 14 47.7	13.097	9	2 32 7.51	2.4581	17 6 32.1	8.568
10	0 38 0.19	2.3943	8 27 51.7	13.035	10	2 34 35.02	2.4589	17 15 2.5	8.446
11	0 40 23.89	2.3957	8 40 51.9	12.971	11	2 37 2.58	2.4598	17 23 25.6	8.323
12	0 42 47.67	2.3971	8 53 48.2	12.907	12	2 39 30.19	2.4605	17 31 41.3	8.199
13	0 45 11.54	2.3985	9 6 40.7	12.841	13	2 41 57.84	2.4613	17 39 49.5	8.075
14	0 47 35.49	2.3999	9 19 29.1	12.773	14	2 44 25.54	2.4620	17 47 50.4	7.951
15	0 49 59.53	2.4014	9 32 13.4	12.703	15	2 46 53.28	2.4627	17 55 43.7	7.825
16	0 52 23.66	2.4028	9 44 53.5	12.633	16	2 49 21.06	2.4633	18 3 29.4	7.698
17	0 54 47.87	2.4043	9 57 29.3	12.560	17	2 51 48.87	2.4638	18 11 7.5	7.571
18	0 57 12.17	2.4058	10 10 0.7	12.487	18	2 54 16.71	2.4643	18 18 37.9	7.443
19	0 59 36.57	2.4073	10 22 27.6	12.411	19	2 56 44.58	2.4647	18 26 0.7	7.315
20	1 2 1.05	2.4088	10 34 50.0	12.334	20	2 59 12.47	2.4651	18 33 15.7	7.186
21	1 4 25.63	2.4103	10 47 7.7	12.255	21	3 1 40.39	2.4655	18 40 23.0	7.058
22	1 6 50.29	2.4118	10 59 20.6	12.175	22	3 4 8.33	2.4658	18 47 22.6	6.928
23	1 9 15.05	2.4133	11 11 28.8	12.094	23	3 6 36.28	2.4660	18 54 14.3	6.796
24	1 11 39.89	2.4148	N. 11 23 32.0	12.011	24	3 9 4.25	2.4663	N. 19 0 58.1	6.665

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 13.					SATURDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 9 4.25	2.4663	N.19 0 58.1	6.665	0	5 6 28.25	2.4002	N.21 45 32.8	0.205
1	3 11 32.23	2.4663	19 7 34.1	6.533	1	5 8 52.17	2.3973	21 45 41.2	+ 0.075
2	3 14 0.21	2.4663	19 14 2.1	6.401	2	5 11 15.92	2.3943	21 45 41.8	− 0.055
3	3 16 28.19	2.4663	19 20 22.2	6.268	3	5 13 39.48	2.3911	21 45 34.6	0.184
4	3 18 56.17	2.4663	19 26 34.3	6.136	4	5 16 2.85	2.3880	21 45 19.7	0.312
5	3 21 24.15	2.4663	19 32 38.5	6.003	5	5 18 26.04	2.3848	21 44 57.2	0.439
6	3 23 52.12	2.4661	19 38 34.7	5.869	6	5 20 49.03	2.3815	21 44 27.0	0.567
7	3 26 20.08	2.4658	19 44 22.8	5.735	7	5 23 11.82	2.3783	21 43 49.1	0.694
8	3 28 48.02	2.4656	19 50 2.9	5.601	8	5 25 34.42	2.3749	21 43 3.7	0.819
9	3 31 15.95	2.4653	19 55 34.9	5.466	9	5 27 56.81	2.3714	21 42 10.8	0.945
10	3 33 43.85	2.4648	20 0 58.8	5.331	10	5 30 18.99	2.3680	21 41 10.3	1.071
11	3 36 11.73	2.4644	20 6 14.6	5.197	11	5 32 40.97	2.3645	21 40 2.3	1.196
12	3 38 39.58	2.4638	20 11 22.4	5.062	12	5 35 2.73	2.3609	21 38 46.8	1.319
13	3 41 7.39	2.4633	20 16 22.0	4.925	13	5 37 24.28	2.3573	21 37 24.0	1.442
14	3 43 35.17	2.4626	20 21 13.4	4.789	14	5 39 45.61	2.3537	21 35 53.8	1.565
15	3 46 2.90	2.4618	20 25 56.7	4.653	15	5 42 6.72	2.3500	21 34 16.2	1.687
16	3 48 30.58	2.4610	20 30 31.8	4.517	16	5 44 27.61	2.3463	21 32 31.4	1.808
17	3 50 58.22	2.4602	20 34 58.7	4.381	17	5 46 48.27	2.3424	21 30 39.3	1.928
18	3 53 25.80	2.4593	20 39 17.5	4.245	18	5 49 8.70	2.3386	21 28 40.0	2.048
19	3 55 53.33	2.4583	20 43 28.1	4.108	19	5 51 28.90	2.3348	21 26 33.6	2.167
20	3 58 20.79	2.4571	20 47 30.4	3.971	20	5 53 48.87	2.3308	21 24 20.0	2.286
21	4 0 48.18	2.4560	20 51 24.6	3.835	21	5 56 8.60	2.3268	21 21 59.3	2.403
22	4 3 15.51	2.4548	20 55 10.6	3.698	22	5 58 28.09	2.3228	21 19 31.6	2.521
23	4 5 42.76	2.4536	N.20 58 48.5	3.562	23	6 0 47.34	2.3188	N.21 16 56.8	2.638
	FRIDAY 14.					SUNDAY 16.			
0	4 8 9.94	2.4523	N.21 2 18.1	3.425	0	6 3 6.35	2.3148	N.21 14 15.1	2.753
1	4 10 37.03	2.4508	21 5 39.5	3.288	1	6 5 25.11	2.3107	21 11 26.5	2.867
2	4 13 4.04	2.4494	21 8 52.7	3.153	2	6 7 43.63	2.3066	21 8 31.1	2.981
3	4 15 30.96	2.4478	21 11 57.8	3.016	3	6 10 1.90	2.3024	21 5 28.8	3.095
4	4 17 57.78	2.4462	21 14 54.6	2.879	4	6 12 19.92	2.2982	21 2 19.7	3.208
5	4 20 24.50	2.4445	21 17 43.3	2.743	5	6 14 37.68	2.2939	20 59 3.9	3.319
6	4 22 51.12	2.4428	21 20 23.8	2.608	6	6 16 55.19	2.2898	20 55 41.4	3.430
7	4 25 17.64	2.4411	21 22 56.2	2.472	7	6 19 12.45	2.2855	20 52 12.3	3.540
8	4 27 44.05	2.4392	21 25 20.4	2.336	8	6 21 29.45	2.2811	20 48 36.6	3.649
9	4 30 10.34	2.4372	21 27 36.5	2.200	9	6 23 46.18	2.2767	20 44 54.4	3.758
10	4 32 36.51	2.4352	21 29 44.4	2.065	10	6 26 2.65	2.2723	20 41 5.6	3.867
11	4 35 2.56	2.4331	21 31 44.3	1.931	11	6 28 18.86	2.2680	20 37 10.4	3.973
12	4 37 28.48	2.4309	21 33 36.1	1.796	12	6 30 34.81	2.2637	20 33 8.8	4.079
13	4 39 54.27	2.4288	21 35 19.8	1.661	13	6 32 50.50	2.2593	20 29 0.9	4.184
14	4 42 19.93	2.4265	21 36 55.4	1.526	14	6 35 5.92	2.2548	20 24 46.7	4.289
15	4 44 45.45	2.4241	21 38 22.9	1.393	15	6 37 21.07	2.2503	20 20 26.2	4.393
16	4 47 10.82	2.4217	21 39 42.5	1.259	16	6 39 35.95	2.2458	20 15 59.5	4.496
17	4 49 36.05	2.4193	21 40 54.0	1.126	17	6 41 50.56	2.2413	20 11 26.7	4.598
18	4 52 1.13	2.4168	21 41 57.6	0.993	18	6 44 4.90	2.2368	20 6 47.7	4.700
19	4 54 26.06	2.4142	21 42 53.2	0.861	19	6 46 18.98	2.2323	20 2 2.7	4.800
20	4 56 50.83	2.4115	21 43 40.9	0.729	20	6 48 32.78	2.2278	19 57 11.7	4.899
21	4 59 15.44	2.4088	21 44 20.7	0.598	21	6 50 46.31	2.2233	19 52 14.8	4.998
22	5 1 39.88	2.4059	21 44 52.6	0.466	22	6 52 59.57	2.2187	19 47 11.9	5.097
23	5 4 4.15	2.4031	21 45 16.6	0.335	23	6 55 12.55	2.2141	19 42 3.2	5.193
24	5 6 28.25	2.4002	N.21 45 32.8	0.205	24	6 57 25.26	2.2095	N.19 36 48.8	5.288

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 17.					WEDNESDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 57 25.26	2.2095	N.19 36 48.8	5.288	0	8 38 20.33	2.0021	N.13 48 27.7	8.899
1	6 59 37.69	2.2049	19 31 28.6	5.384	1	8 40 20.34	1.9983	13 39 32.1	8.953
2	7 1 49.85	2.2004	19 26 2.7	5.479	2	8 42 20.13	1.9947	13 30 33.3	9.008
3	7 4 1.74	2.1958	19 20 31.1	5.573	3	8 44 19.70	1.9910	13 21 31.2	9.061
4	7 6 13.35	2.1912	19 14 54.0	5.665	4	8 46 19.05	1.9874	13 12 26.0	9.113
5	7 8 24.68	2.1866	19 9 11.3	5.758	5	8 48 18.19	1.9838	13 3 17.7	9.164
6	7 10 35.74	2.1821	19 3 23.1	5.848	6	8 50 17.11	1.9802	12 54 6.3	9.215
7	7 12 46.53	2.1775	18 57 29.5	5.938	7	8 52 15.81	1.9766	12 44 51.9	9.265
8	7 14 57.04	2.1729	18 51 30.5	6.028	8	8 54 14.30	1.9732	12 35 34.5	9.315
9	7 17 7.28	2.1683	18 45 26.2	6.116	9	8 56 12.59	1.9698	12 26 14.1	9.363
10	7 19 17.24	2.1638	18 39 16.6	6.204	10	8 58 10.67	1.9663	12 16 50.9	9.411
11	7 21 26.93	2.1593	18 33 1.7	6.291	11	9 0 8.55	1.9630	12 7 24.8	9.458
12	7 23 36.35	2.1547	18 26 41.7	6.376	12	9 2 6.23	1.9597	11 57 56.0	9.503
13	7 25 45.49	2.1501	18 20 16.6	6.461	13	9 4 3.71	1.9563	11 48 24.4	9.549
14	7 27 54.36	2.1455	18 13 46.4	6.545	14	9 6 0.99	1.9531	11 38 50.1	9.593
15	7 30 2.95	2.1410	18 7 11.2	6.628	15	9 7 58.08	1.9498	11 29 13.2	9.637
16	7 32 11.28	2.1365	18 0 31.0	6.711	16	9 9 54.97	1.9467	11 19 33.7	9.680
17	7 34 19.33	2.1319	17 53 45.9	6.793	17	9 11 51.68	1.9436	11 9 51.6	9.723
18	7 36 27.11	2.1274	17 46 55.9	6.873	18	9 13 48.20	1.9404	11 0 6.9	9.765
19	7 38 34.62	2.1229	17 40 1.1	6.953	19	9 15 44.53	1.9373	10 50 19.8	9.805
20	7 40 41.86	2.1185	17 33 1.5	7.033	20	9 17 40.68	1.9344	10 40 30.2	9.845
21	7 42 48.84	2.1141	17 25 57.2	7.110	21	9 19 36.66	1.9315	10 30 38.3	9.884
22	7 44 55.55	2.1096	17 18 48.3	7.187	22	9 21 32.46	1.9286	10 20 44.1	9.923
23	7 47 1.99	2.1051	N.17 11 34.8	7.263	23	9 23 28.09	1.9257	N.10 10 47.6	9.961
	TUESDAY 18.					THURSDAY 20.			
0	7 49 8.16	2.1007	N.17 4 16.7	7.339	0	9 25 23.54	1.9228	N.10 0 48.8	9.998
1	7 51 14.07	2.0963	16 56 54.1	7.413	1	9 27 18.82	1.9200	9 50 47.8	10.034
2	7 53 19.72	2.0920	16 49 27.1	7.488	2	9 29 13.94	1.9173	9 40 44.7	10.069
3	7 55 25.11	2.0876	16 41 55.6	7.561	3	9 31 8.90	1.9146	9 30 39.5	10.104
4	7 57 30.23	2.0833	16 34 19.7	7.633	4	9 33 3.69	1.9118	9 20 32.2	10.138
5	7 59 35.10	2.0790	16 26 39.6	7.703	5	9 34 58.32	1.9093	9 10 22.9	10.172
6	8 1 39.71	2.0747	16 18 55.3	7.773	6	9 36 52.80	1.9067	9 0 11.6	10.204
7	8 3 44.06	2.0704	16 11 6.8	7.843	7	9 38 47.12	1.9041	8 49 58.4	10.236
8	8 5 48.16	2.0663	16 3 14.1	7.913	8	9 40 41.29	1.9016	8 39 43.3	10.268
9	8 7 52.01	2.0620	15 55 17.3	7.981	9	9 42 35.31	1.8992	8 29 26.3	10.298
10	8 9 55.60	2.0578	15 47 16.4	8.048	10	9 44 29.19	1.8967	8 19 7.5	10.328
11	8 11 58.94	2.0536	15 39 11.6	8.113	11	9 46 22.92	1.8943	8 8 47.0	10.357
12	8 14 2.03	2.0495	15 31 2.8	8.179	12	9 48 16.51	1.8921	7 58 24.7	10.385
13	8 16 4.88	2.0454	15 22 50.1	8.243	13	9 50 9.97	1.8898	7 48 0.8	10.413
14	8 18 7.48	2.0413	15 14 33.6	8.307	14	9 52 3.29	1.8876	7 37 35.2	10.440
15	8 20 9.83	2.0372	15 6 13.3	8.370	15	9 53 56.48	1.8854	7 27 8.0	10.467
16	8 22 11.94	2.0332	14 57 49.2	8.433	16	9 55 49.54	1.8833	7 16 39.2	10.492
17	8 24 13.81	2.0292	14 49 21.4	8.493	17	9 57 42.47	1.8812	7 6 9.0	10.516
18	8 26 15.44	2.0253	14 40 50.0	8.553	18	9 59 35.28	1.8791	6 55 37.3	10.541
19	8 28 16.84	2.0213	14 32 15.0	8.613	19	10 1 27.96	1.8771	6 45 4.1	10.564
20	8 30 18.00	2.0174	14 23 36.4	8.672	20	10 3 20.53	1.8752	6 34 29.6	10.586
21	8 32 18.93	2.0135	14 14 54.4	8.729	21	10 5 12.98	1.8733	6 23 53.8	10.608
22	8 34 19.62	2.0097	14 6 8.9	8.787	22	10 7 5.32	1.8714	6 13 16.6	10.631
23	8 36 20.09	2.0059	13 57 20.0	8.843	23	10 8 57.55	1.8696	6 2 38.1	10.651
24	8 38 20.33	2.0021	N.13 48 27.7	8.899	24	10 10 49.67	1.8678	N. 5 51 58.5	10.670

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 21.					SUNDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 10 49.67	1.8678	N. 5 51 58.5	10.670	0	11 39 18.76	1.8367	S. 2 50 25.6	10.843
1	10 12 41.69	1.8661	5 41 17.7	10.690	1	11 41 8.97	1.8371	3 1 15.8	10.830
2	10 14 33.60	1.8643	5 30 35.7	10.709	2	11 42 59.21	1.8377	3 12 5.2	10.817
3	10 16 25.41	1.8627	5 19 52.6	10.727	3	11 44 49.49	1.8383	3 22 53.8	10.803
4	10 18 17.13	1.8612	5 9 8.5	10.743	4	11 46 39.80	1.8388	3 33 41.5	10.788
5	10 20 8.75	1.8596	4 58 23.4	10.760	5	11 48 30.14	1.8394	3 44 28.4	10.773
6	10 22 0.28	1.8581	4 47 37.3	10.776	6	11 50 20.53	1.8402	3 55 14.3	10.758
7	10 23 51.72	1.8567	4 36 50.3	10.791	7	11 52 10.96	1.8408	4 5 59.3	10.742
8	10 25 43.08	1.8553	4 26 2.4	10.806	8	11 54 1.43	1.8416	4 16 43.3	10.724
9	10 27 34.35	1.8538	4 15 13.6	10.820	9	11 55 51.95	1.8424	4 27 26.2	10.706
10	10 29 25.54	1.8526	4 4 24.0	10.833	10	11 57 42.52	1.8433	4 38 8.0	10.688
11	10 31 16.66	1.8514	3 53 33.7	10.845	11	11 59 33.14	1.8441	4 48 48.7	10.668
12	10 33 7.71	1.8502	3 42 42.6	10.857	12	12 1 23.81	1.8450	4 59 28.2	10.649
13	10 34 58.68	1.8489	3 31 50.8	10.868	13	12 3 14.54	1.8460	5 10 6.6	10.629
14	10 36 49.58	1.8478	3 20 58.4	10.878	14	12 5 5.33	1.8471	5 20 43.7	10.608
15	10 38 40.41	1.8467	3 10 5.4	10.888	15	12 6 56.19	1.8482	5 31 19.5	10.586
16	10 40 31.18	1.8457	2 59 11.8	10.898	16	12 8 47.11	1.8492	5 41 54.0	10.563
17	10 42 21.89	1.8447	2 48 17.7	10.906	17	12 10 38.09	1.8503	5 52 27.1	10.541
18	10 44 12.54	1.8438	2 37 23.1	10.913	18	12 12 29.15	1.8516	6 2 58.9	10.518
19	10 46 3.14	1.8429	2 26 28.1	10.921	19	12 14 20.28	1.8528	6 13 29.2	10.493
20	10 47 53.69	1.8420	2 15 32.6	10.928	20	12 16 11.48	1.8540	6 23 58.1	10.468
21	10 49 44.18	1.8412	2 4 36.8	10.933	21	12 18 2.76	1.8553	6 34 25.4	10.443
22	10 51 34.63	1.8404	1 53 40.5	10.938	22	12 19 54.12	1.8567	6 44 51.2	10.417
23	10 53 25.03	1.8398	N. 1 42 44.1	10.942	23	12 21 45.56	1.8581	S. 6 55 15.4	10.389
	SATURDAY 22.					MONDAY 24.			
0	10 55 15.40	1.8391	N. 1 31 47.5	10.946	0	12 23 37.09	1.8595	S. 7 5 37.9	10.362
1	10 57 5.72	1.8384	1 20 50.6	10.950	1	12 25 28.70	1.8609	7 15 58.8	10.333
2	10 58 56.01	1.8378	1 9 53.5	10.952	2	12 27 20.40	1.8625	7 26 17.9	10.304
3	11 0 46.26	1.8373	0 58 56.4	10.953	3	12 29 12.20	1.8641	7 36 35.3	10.276
4	11 2 36.48	1.8368	0 47 59.1	10.956	4	12 31 4.09	1.8657	7 46 51.0	10.246
5	11 4 26.68	1.8364	0 37 1.7	10.957	5	12 32 56.08	1.8673	7 57 4.8	10.214
6	11 6 16.85	1.8360	0 26 4.3	10.956	6	12 34 48.16	1.8689	8 7 16.7	10.183
7	11 8 7.00	1.8356	0 15 7.0	10.955	7	12 36 40.35	1.8707	8 17 26.7	10.150
8	11 9 57.12	1.8353	N. 0 4 9.7	10.953	8	12 38 32.64	1.8724	8 27 34.7	10.118
9	11 11 47.23	1.8351	S. 0 6 47.4	10.951	9	12 40 25.04	1.8742	8 37 40.8	10.084
10	11 13 37.33	1.8349	0 17 44.4	10.949	10	12 42 17.54	1.8759	8 47 44.8	10.050
11	11 15 27.42	1.8348	0 28 41.3	10.946	11	12 44 10.15	1.8778	8 57 46.8	10.015
12	11 17 17.50	1.8346	0 39 37.9	10.941	12	12 46 2.87	1.8797	9 7 46.6	9.979
13	11 19 7.57	1.8345	0 50 34.2	10.937	13	12 47 55.71	1.8817	9 17 44.3	9.943
14	11 20 57.64	1.8345	1 1 30.3	10.932	14	12 49 48.67	1.8836	9 27 39.8	9.907
15	11 22 47.71	1.8345	1 12 26.0	10.925	15	12 51 41.74	1.8855	9 37 33.1	9.870
16	11 24 37.78	1.8346	1 23 21.3	10.918	16	12 53 34.93	1.8876	9 47 24.2	9.832
17	11 26 27.86	1.8347	1 34 16.2	10.911	17	12 55 28.25	1.8898	9 57 12.9	9.793
18	11 28 17.94	1.8348	1 45 10.6	10.903	18	12 57 21.70	1.8918	10 6 59.3	9.753
19	11 30 8.03	1.8350	1 56 4.6	10.895	19	12 59 15.27	1.8939	10 16 43.3	9.713
20	11 31 58.14	1.8353	2 6 58.0	10.886	20	13 1 8.97	1.8961	10 26 24.8	9.672
21	11 33 48.26	1.8356	2 17 50.9	10.876	21	13 3 2.80	1.8983	10 36 3.9	9.631
22	11 35 38.41	1.8359	2 28 43.1	10.865	22	13 4 56.77	1.9006	10 45 40.5	9.588
23	11 37 28.57	1.8363	2 39 34.7	10.854	23	13 6 50.87	1.9028	10 55 14.5	9.544
24	11 39 18.76	1.8367	S. 2 50 25.6	10.843	24	13 8 45.11	1.9052	S. 11 4 45.9	9.501

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 25.					THURSDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 8 45.11	1.9052	S.11 4 45.9	9.501	0	14 43 23.81	2.0468	S.17 37 44.3	6.609
1	13 10 39.49	1.9075	11 14 14.7	9.458	1	14 45 26.72	2.0502	17 44 18.6	6.532
2	13 12 34.01	1.9099	11 23 40.9	9.413	2	14 47 29.83	2.0535	17 50 48.2	6.455
3	13 14 28.68	1.9123	11 33 4.3	9.367	3	14 49 33.14	2.0569	17 57 13.2	6.377
4	13 16 23.49	1.9148	11 42 24.9	9.321	4	14 51 36.66	2.0603	18 3 33.4	6.297
5	13 18 18.45	1.9173	11 51 42.8	9.274	5	14 53 40.38	2.0637	18 9 48.8	6.217
6	13 20 13.56	1.9198	12 0 57.8	9.226	6	14 55 44.30	2.0671	18 15 59.4	6.137
7	13 22 8.82	1.9223	12 10 9.9	9.178	7	14 57 48.43	2.0705	18 22 5.2	6.057
8	13 24 4.23	1.9248	12 19 19.1	9.129	8	14 59 52.76	2.0739	18 28 6.2	5.975
9	13 25 59.80	1.9275	12 28 25.4	9.080	9	15 1 57.30	2.0773	18 34 2.2	5.892
10	13 27 55.53	1.9301	12 37 28.7	9.029	10	15 4 2.04	2.0807	18 39 53.2	5.808
11	13 29 51.41	1.9327	12 46 28.9	8.978	11	15 6 6.98	2.0840	18 45 39.2	5.725
12	13 31 47.45	1.9354	12 55 26.0	8.926	12	15 8 12.12	2.0874	18 51 20.2	5.641
13	13 33 43.66	1.9382	13 4 20.0	8.874	13	15 10 17.47	2.0909	18 56 56.1	5.556
14	13 35 40.03	1.9408	13 13 10.9	8.822	14	15 12 23.03	2.0943	19 2 26.9	5.470
15	13 37 36.56	1.9436	13 21 58.6	8.768	15	15 14 28.79	2.0977	19 7 52.5	5.384
16	13 39 33.26	1.9464	13 30 43.0	8.713	16	15 16 34.75	2.1010	19 13 13.0	5.298
17	13 41 30.13	1.9493	13 39 24.1	8.658	17	15 18 40.91	2.1044	19 18 28.2	5.209
18	13 43 27.17	1.9521	13 48 1.9	8.602	18	15 20 47.28	2.1078	19 23 38.1	5.121
19	13 45 24.38	1.9549	13 56 36.3	8.545	19	15 22 53.85	2.1112	19 28 42.7	5.033
20	13 47 21.76	1.9578	14 5 7.3	8.488	20	15 25 0.62	2.1146	19 33 42.0	4.943
21	13 49 19.32	1.9608	14 13 34.9	8.431	21	15 27 7.60	2.1180	19 38 35.9	4.853
22	13 51 17.05	1.9637	14 21 59.0	8.372	22	15 29 14.78	2.1213	19 43 24.4	4.763
23	13 53 14.96	1.9667	S.14 30 19.5	8.313	23	15 31 22.16	2.1246	S.19 48 7.4	4.671
	WEDNESDAY 26.					FRIDAY 28.			
0	13 55 13.05	1.9697	S.14 38 36.5	8.253	0	15 33 29.73	2.1279	S.19 52 44.9	4.579
1	13 57 11.32	1.9727	14 46 49.9	8.193	1	15 35 37.51	2.1313	19 57 16.9	4.487
2	13 59 9.77	1.9757	14 54 59.6	8.131	2	15 37 45.49	2.1347	20 1 43.3	4.393
3	14 1 8.40	1.9788	15 3 5.6	8.068	3	15 39 53.67	2.1379	20 6 4.1	4.299
4	14 3 7.22	1.9818	15 11 7.8	8.006	4	15 42 2.04	2.1412	20 10 19.2	4.205
5	14 5 6.22	1.9849	15 19 6.3	7.943	5	15 44 10.61	2.1444	20 14 28.7	4.110
6	14 7 5.41	1.9881	15 27 1.0	7.879	6	15 46 19.37	2.1477	20 18 32.4	4.014
7	14 9 4.79	1.9912	15 34 51.8	7.814	7	15 48 28.33	2.1510	20 22 30.4	3.918
8	14 11 4.35	1.9943	15 42 38.7	7.748	8	15 50 37.49	2.1543	20 26 22.6	3.822
9	14 13 4.11	1.9975	15 50 21.6	7.683	9	15 52 46.84	2.1574	20 30 9.0	3.724
10	14 15 4.05	2.0007	15 58 0.6	7.616	10	15 54 56.38	2.1606	20 33 49.5	3.626
11	14 17 4.19	2.0039	16 5 35.5	7.548	11	15 57 6.11	2.1637	20 37 24.1	3.528
12	14 19 4.52	2.0071	16 13 6.3	7.479	12	15 59 16.02	2.1668	20 40 52.8	3.428
13	14 21 5.04	2.0103	16 20 33.0	7.411	13	16 1 26.13	2.1701	20 44 15.5	3.328
14	14 23 5.76	2.0136	16 27 55.6	7.342	14	16 3 36.43	2.1732	20 47 32.2	3.229
15	14 25 6.67	2.0168	16 35 14.0	7.272	15	16 5 46.91	2.1763	20 50 43.1	3.128
16	14 27 7.78	2.0202	16 42 28.2	7.201	16	16 7 57.58	2.1793	20 53 47.7	3.027
17	14 29 9.09	2.0234	16 49 38.1	7.129	17	16 10 8.43	2.1823	20 56 46.3	2.925
18	14 31 10.59	2.0267	16 56 43.7	7.057	18	16 12 19.46	2.1854	20 59 38.7	2.823
19	14 33 12.29	2.0301	17 3 44.9	6.983	19	16 14 30.68	2.1884	21 2 25.0	2.720
20	14 35 14.20	2.0334	17 10 41.7	6.910	20	16 16 42.07	2.1913	21 5 5.1	2.616
21	14 37 16.30	2.0367	17 17 34.1	6.836	21	16 18 53.64	2.1943	21 7 38.9	2.512
22	14 39 18.60	2.0400	17 24 22.0	6.761	22	16 21 5.39	2.1973	21 10 6.5	2.408
23	14 41 21.10	2.0434	17 31 5.4	6.686	23	16 23 17.31	2.2001	21 12 27.8	2.303
24	14 43 23.81	2.0468	S.17 37 44.3	6.609	24	16 25 29.40	2.2030	S.21 14 42.8	2.198

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 29.			
	h m s	s	° ′ ″	″
0	16 25 29.40	2.2030	S.21 14 42.8	2.198
1	16 27 41.67	2.2058	21 16 51.5	2.092
2	16 29 54.10	2.2086	21 18 53.8	1.985
3	16 32 6.70	2.2114	21 20 49.7	1.878
4	16 34 19.47	2.2142	21 22 39.1	1.770
5	16 36 32.40	2.2169	21 24 22.1	1.663
6	16 38 45.50	2.2196	21 25 58.7	1.555
7	16 40 58.75	2.2222	21 27 28.7	1.446
8	16 43 12.16	2.2248	21 28 52.2	1.337
9	16 45 25.73	2.2274	21 30 9.1	1.227
10	16 47 39.45	2.2300	21 31 19.4	1.117
11	16 49 53.33	2.2326	21 32 23.1	1.006
12	16 52 7.36	2.2351	21 33 20.1	0.895
13	16 54 21.54	2.2375	21 34 10.5	0.784
14	16 56 35.86	2.2398	21 34 54.2	0.673
15	16 58 50.32	2.2423	21 35 31.2	0.561
16	17 1 4.93	2.2447	21 36 1.5	0.448
17	17 3 19.68	2.2469	21 36 25.0	0.335
18	17 5 34.56	2.2492	21 36 41.7	0.223
19	17 7 49.58	2.2514	21 36 51.7	− 0.109
20	17 10 4.73	2.2536	21 36 54.8	+ 0.005
21	17 12 20.01	2.2558	21 36 51.1	0.119
22	17 14 35.42	2.2578	21 36 40.5	0.233
23	17 16 50.95	2.2599	S.21 36 23.1	0.348
	SUNDAY 30.			
0	17 19 6.61	2.2620	S.21 35 58.7	0.463
1	17 21 22.39	2.2640	21 35 27.5	0.578
2	17 23 38.29	2.2660	21 34 49.3	0.694
3	17 25 54.31	2.2679	21 34 4.2	0.810
4	17 28 10.44	2.2698	21 33 12.1	0.926
5	17 30 26.68	2.2716	21 32 13.1	1.042
6	17 32 43.03	2.2734	21 31 7.1	1.159
7	17 34 59.49	2.2752	21 29 54.0	1.277
8	17 37 16.05	2.2768	21 28 33.9	1.393
9	17 39 32.71	2.2785	21 27 6.8	1.510
10	17 41 49.47	2.2802	21 25 32.7	1.628
11	17 44 6.33	2.2818	21 23 51.5	1.746
12	17 46 23.28	2.2833	21 22 3.2	1.863
13	17 48 40.33	2.2848	21 20 7.9	1.981
14	17 50 57.46	2.2863	21 18 5.5	2.100
15	17 53 14.68	2.2878	21 15 55.9	2.218
16	17 55 31.99	2.2892	21 13 39.3	2.336
17	17 57 49.38	2.2905	21 11 15.6	2.454
18	18 0 6.85	2.2918	21 8 44.8	2.573
19	18 2 24.40	2.2931	21 6 6.8	2.693
20	18 4 42.02	2.2943	21 3 21.7	2.811
21	18 6 59.71	2.2954	21 0 29.5	2.929
22	18 9 17.47	2.2966	20 57 30.2	3.048
23	18 11 35.30	2.2977	20 54 23.7	3.167
24	18 13 53.20	2.2988	S.20 51 10.1	3.286

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY, OCTOBER 1.			
	h m s	s	° ′ ″	″
0	18 13 53.20	2.2988	S.20 51 10.1	3.286

PHASES OF THE MOON.

			d	h	m
☽	First Quarter . . . . Sept.		1	19	55.8
○	Full Moon		8	17	6.2
☾	Last Quarter		15	8	57.2
●	New Moon		23	7	57.1

		d	h
☾	Perigee . . . . Sept.	9	6.4
☾	Apogee	23	16.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	SUN	W.	80 30 3	3259	81 55 3	3245	83 20 19	3231	84 45 51	3216
	Spica	W.	36 37 34	2889	38 10 7	2876	39 42 56	2863	41 16 2	2849
	SATURN	E.	29 24 16	2888	27 51 42	2876	26 18 52	2863	24 45 46	2850
	Fomalhaut	E.	92 57 23	3356	91 34 16	3343	90 10 54	3329	88 47 16	3316
2	SUN	W.	91 58 5	3137	93 25 30	3120	94 53 15	3103	96 21 20	3086
	Spica	W.	49 6 7	2775	50 41 7	2760	52 16 27	2744	53 52 8	2728
	JUPITER	W.	8 38 20	2824	10 12 17	2806	11 46 37	2788	13 21 20	2769
	Fomalhaut	E.	81 45 28	3256	80 20 25	3245	78 55 9	3235	77 29 40	3225
3	SUN	W.	103 47 17	2994	105 17 37	2975	106 48 21	2956	108 19 28	2937
	Spica	W.	61 56 7	2643	63 34 4	2624	65 12 26	2606	66 51 13	2588
	JUPITER	W.	21 21 4	2678	22 58 13	2660	24 35 46	2642	26 13 44	2623
	Antares	W.	17 2 51	2796	18 37 22	2761	20 12 43	2728	21 48 46	2693
	Fomalhaut	E.	70 19 33	3183	68 53 3	3178	67 26 27	3173	65 59 46	3170
4	SUN	W.	116 1 19	2838	117 34 57	2818	119 9 1	2798	120 43 31	2779
	Spica	W.	75 11 27	2494	76 52 48	2476	78 34 35	2457	80 16 49	2437
	JUPITER	W.	34 30 2	2529	36 10 35	2510	37 51 35	2490	39 33 2	2471
	Antares	W.	29 59 45	2551	31 39 48	2526	33 20 25	2503	35 1 34	2480
	Fomalhaut	E.	58 45 52	3176	57 19 14	3183	55 52 45	3194	54 26 29	3207
	α Arietis	E.	117 44 9	2539	116 3 50	2518	114 23 2	2499	112 41 48	2479
5	JUPITER	W.	48 7 1	2376	49 51 10	2357	51 35 46	2339	53 20 48	2321
	Antares	W.	43 35 11	2373	45 19 25	2352	47 4 9	2333	48 49 21	2313
	SATURN	W.	22 56 38	2348	24 41 27	2329	26 26 44	2310	28 12 28	2291
	Fomalhaut	E.	47 20 32	3336	45 57 2	3379	44 34 21	3429	43 12 37	3488
	α Arietis	E.	104 8 34	2381	102 24 32	2362	100 40 2	2343	98 55 5	2325
6	JUPITER	W.	62 12 32	2234	64 0 9	2218	65 48 10	2202	67 36 35	2186
	Antares	W.	57 42 21	2221	59 30 17	2204	61 18 39	2187	63 7 26	2170
	SATURN	W.	37 7 50	2204	38 56 12	2188	40 44 58	2172	42 34 8	2156
	α Arietis	E.	90 3 46	2237	88 16 14	2220	86 28 17	2205	84 39 57	2190
	Aldebaran	E.	123 10 7	2226	121 22 18	2208	119 34 3	2191	117 45 22	2175
7	JUPITER	W.	76 44 19	2116	78 34 54	2103	80 25 48	2092	82 17 0	2081
	Antares	W.	72 17 10	2099	74 8 11	2086	75 59 31	2074	77 51 10	2062
	SATURN	W.	51 45 38	2086	53 36 59	2073	55 28 39	2062	57 20 37	2051
	α Arietis	E.	75 32 50	2122	73 42 25	2111	71 51 42	2100	70 0 43	2090
	Aldebaran	E.	108 36 7	2102	106 45 11	2090	104 53 56	2078	103 2 22	2066
8	JUPITER	W.	91 36 56	2035	93 29 35	2029	95 22 25	2023	97 15 24	2017
	Antares	W.	87 13 26	2017	89 6 33	2010	90 59 51	2004	92 53 19	1998
	SATURN	W.	66 44 25	2005	68 37 51	1999	70 31 27	1993	72 25 13	1988
	α Arietis	E.	60 42 18	2052	58 50 4	2047	56 57 43	2043	55 5 16	2040
	Aldebaran	E.	93 40 29	2020	91 47 26	2013	89 54 12	2007	88 0 48	2001
9	JUPITER	W.	106 42 3	2002	108 35 34	2001	110 29 6	2001	112 22 38	2003
	SATURN	W.	81 55 45	1972	83 50 3	1972	85 44 22	1972	87 38 41	1973
	Aldebaran	E.	78 32 8	1987	76 38 13	1986	74 44 17	1987	72 50 22	1988
	MARS	E.	118 54 36	2163	117 5 12	2162	115 15 47	2161	113 26 21	2162
	Pollux	E.	120 23 27	2062	118 31 29	2058	116 39 25	2055	114 47 16	2053

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	SUN	W.	86 11 41	3201	87 37 49	3186	89 4 15	3170	90 31 0	3153
	Spica	W.	42 49 26	2835	44 23 8	2821	45 57 8	2806	47 31 28	2792
	SATURN	E.	23 12 24	2838	21 38 45	2824	20 4 48	2811	18 30 35	2798
	Fomalhaut	E.	87 23 23	3304	85 59 16	3291	84 34 54	3279	83 10 18	3267
2	SUN	W.	97 49 47	3068	99 18 36	3050	100 47 47	3031	102 17 21	3013
	Spica	W.	55 28 11	2711	57 4 36	2695	58 41 23	2678	60 18 33	2660
	JUPITER	W.	14 56 28	2751	16 32 0	2732	18 7 57	2714	19 44 18	2695
	Fomalhaut	E.	76 4 0	3214	74 38 8	3206	73 12 6	3198	71 45 54	3190
3	SUN	W.	109 51 0	2917	111 22 57	2898	112 55 19	2878	114 28 6	2858
	Spica	W.	68 30 25	2569	70 10 2	2551	71 50 4	2533	73 30 32	2513
	JUPITER	W.	27 52 9	2604	29 30 59	2586	31 10 13	2566	32 49 54	2547
	Antares	W.	23 25 35	2660	25 3 9	2629	26 41 24	2601	28 20 17	2576
	Fomalhaut	E.	64 33 1	3168	63 6 13	3167	61 39 24	3168	60 12 36	3171
4	SUN	W.	122 18 26	2760	123 53 47	2740	125 29 34	2721	127 5 46	2701
	Spica	W.	81 59 31	2418	83 42 40	2399	85 26 16	2381	87 10 18	2362
	JUPITER	W.	41 14 56	2452	42 57 17	2433	44 40 4	2414	46 23 19	2395
	Antares	W.	36 43 15	2458	38 25 28	2436	40 8 12	2415	41 51 26	2394
	Fomalhaut	E.	53 0 28	3224	51 34 47	3245	50 9 31	3270	48 44 44	3300
	a Arietis	E.	111 0 6	2459	109 17 55	2439	107 35 16	2419	105 52 9	2400
5	JUPITER	W.	55 6 17	2303	56 52 12	2285	58 38 33	2268	60 25 20	2251
	Antares	W.	50 35 2	2294	52 21 11	2275	54 7 47	2256	55 54 51	2239
	SATURN	W.	29 58 40	2273	31 45 19	2256	33 32 23	2238	35 19 53	2220
	Fomalhaut	E.	41 51 59	3555	40 32 36	3638	39 14 43	3733	37 58 31	3844
	a Arietis	E.	97 9 42	2307	95 23 52	2289	93 37 36	2271	91 50 54	2253
6	JUPITER	W.	69 25 24	2171	71 14 35	2156	73 4 9	2142	74 54 4	2129
	Antares	W.	64 56 38	2155	66 46 13	2141	68 36 10	2126	70 26 29	2112
	SATURN	W.	44 23 42	2141	46 13 38	2127	48 3 57	2113	49 54 37	2099
	a Arietis	E.	82 51 14	2175	81 2 9	2161	79 12 43	2148	77 22 56	2135
	Aldebaran	E.	115 56 17	2159	114 6 48	2144	112 16 56	2130	110 26 42	2116
7	JUPITER	W.	84 8 29	2070	86 0 14	2061	87 52 14	2052	89 44 28	2042
	Antares	W.	79 43 7	2052	81 35 20	2042	83 27 48	2033	85 20 31	2025
	SATURN	W.	59 12 52	2041	61 5 23	2031	62 58 10	2022	64 51 11	2013
	a Arietis	E.	68 9 28	2081	66 17 59	2072	64 26 17	2064	62 34 23	2057
	Aldebaran	E.	101 10 31	2055	99 18 23	2045	97 25 59	2036	95 33 21	2027
8	JUPITER	W.	99 8 32	2012	101 1 47	2009	102 55 8	2006	104 48 34	2004
	Antares	W.	94 46 56	1993	96 40 41	1990	98 34 31	1987	100 28 26	1984
	SATURN	W.	74 19 7	1983	76 13 8	1979	78 7 16	1976	80 1 29	1974
	a Arietis	E.	53 12 44	2039	51 20 10	2039	49 27 36	2039	47 35 3	2041
	Aldebaran	E.	86 7 16	1996	84 13 36	1993	82 19 51	1990	80 26 1	1988
9	JUPITER	W.	114 16 8	2005	116 9 35	2007	118 2 59	2010	119 56 17	2014
	SATURN	W.	89 32 59	1974	91 27 13	1977	93 21 23	1981	95 15 28	1985
	Aldebaran	E.	70 56 29	1991	69 2 40	1993	67 8 55	1997	65 15 16	2002
	MARS	E.	111 36 56	2163	109 47 33	2166	107 58 14	2169	106 8 59	2172
	Pollux	E.	112 55 5	2053	111 2 53	2053	109 10 41	2055	107 18 32	2058

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	SATURN	W.	97 9 28	1989	99 3 20	1995	100 57 2	2001	102 50 35	2007
	Fomalhaut	W.	41 21 7	3215	42 46 58	3134	44 14 26	3065	45 43 19	3005
	Aldebaran	E.	63 21 45	2008	61 28 23	2013	59 35 9	2020	57 42 6	2029
	MARS	E.	104 19 50	2178	102 30 49	2184	100 41 57	2190	98 53 14	2196
	Pollux	E.	105 26 26	2061	103 34 26	2065	101 42 33	2070	99 50 48	2076
	VENUS	E.	115 52 35	2253	114 5 27	2260	112 18 29	2267	110 31 41	2274
11	SATURN	W.	112 15 12	2053	114 7 23	2065	115 59 16	2076	117 50 53	2088
	Fomalhaut	W.	53 23 26	2808	54 57 43	2786	56 32 29	2766	58 7 41	2750
	α Pegasi	W.	32 14 36	2569	33 54 14	2531	35 34 44	2502	37 15 54	2480
	Aldebaran	E.	48 20 28	2081	46 28 59	2094	44 37 51	2108	42 47 4	2122
	MARS	E.	89 52 39	2243	88 5 16	2255	86 18 10	2267	84 31 21	2279
	Pollux	E.	90 34 47	2119	88 44 17	2130	86 54 4	2142	85 4 9	2154
	VENUS	E.	101 40 52	2324	99 55 28	2336	98 10 21	2348	96 25 32	2362
12	Fomalhaut	W.	66 7 32	2716	67 43 50	2716	69 20 9	2718	70 56 25	2721
	α Pegasi	W.	45 47 49	2427	47 30 45	2425	49 13 44	2426	50 56 41	2429
	MARS	E.	75 42 10	2350	73 57 23	2366	72 12 59	2382	70 28 58	2398
	Pollux	E.	75 59 31	2226	74 11 42	2241	72 24 16	2258	70 37 15	2275
	VENUS	E.	87 46 30	2436	86 3 46	2452	84 21 25	2468	82 39 27	2485
	Regulus	E.	112 44 8	2172	110 54 59	2186	109 6 11	2200	107 17 44	2216
13	Fomalhaut	W.	78 55 53	2762	80 31 11	2774	82 6 13	2787	83 40 58	2800
	α Pegasi	W.	59 29 41	2465	61 11 43	2475	62 53 31	2487	64 35 3	2499
	Pollux	E.	61 48 42	2368	60 4 22	2389	58 20 32	2410	56 37 11	2431
	MARS	E.	61 54 52	2485	60 13 18	2503	58 32 9	2521	56 51 25	2540
	VENUS	E.	74 15 40	2574	72 36 9	2593	70 57 4	2611	69 18 24	2629
	Regulus	E.	98 21 15	2295	96 35 8	2312	94 49 26	2329	93 4 8	2346
	SUN	E.	120 7 36	2604	118 28 47	2623	116 50 23	2640	115 12 23	2658
14	Fomalhaut	W.	91 29 54	2882	93 2 36	2901	94 34 53	2921	96 6 45	2941
	α Arietis	W.	29 20 28	2565	31 0 11	2568	32 39 50	2572	34 19 23	2578
	Pollux	E.	48 8 12	2545	46 28 2	2572	44 48 28	2597	43 9 29	2624
	MARS	E.	48 34 17	2635	46 56 10	2655	45 18 29	2675	43 41 15	2694
	VENUS	E.	61 11 27	2725	59 35 20	2744	57 59 39	2763	56 24 23	2782
	Regulus	E.	84 23 51	2432	82 41 2	2449	80 58 37	2467	79 16 37	2484
	SUN	E.	107 8 24	2748	105 32 48	2767	103 57 37	2785	102 22 50	2803
15	α Arietis	W.	42 34 27	2627	44 12 45	2639	45 50 47	2652	47 28 31	2664
	Pollux	E.	35 4 15	2781	33 29 22	2819	31 55 19	2859	30 22 8	2906
	MARS	E.	35 41 43	2796	34 7 10	2817	32 33 4	2838	30 59 25	2860
	VENUS	E.	48 34 14	2876	47 1 25	2895	45 29 0	2913	43 56 58	2932
	Regulus	E.	70 52 39	2570	69 13 3	2587	67 33 50	2604	65 55 0	2620
	SUN	E.	94 34 47	2893	93 2 19	2911	91 30 14	2929	89 58 32	2946
16	α Arietis	W.	55 33 6	2727	57 9 10	2740	58 44 57	2752	60 20 28	2765
	Aldebaran	W.	22 30 3	2785	24 4 50	2788	25 39 33	2792	27 14 11	2797
	VENUS	E.	36 22 30	3020	34 52 42	3038	33 23 17	3055	31 54 12	3073
	Regulus	E.	57 46 23	2701	56 9 45	2717	54 33 28	2732	52 57 31	2747
	SUN	E.	82 25 20	3029	80 55 43	3045	79 26 26	3060	77 57 28	3076
17	α Arietis	W.	68 13 58	2825	69 47 53	2837	71 21 33	2848	72 54 59	2859

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	Saturn	W.	104 43 58	2016	106 37 8	2025	108 30 3	2034	110 22 44	2043
	Fomalhaut	W.	47 13 26	2953	48 44 38	2908	50 16 47	2869	51 49 45	2836
	Aldebaran	E.	55 49 17	2037	53 56 41	2047	52 4 20	2058	50 12 15	2069
	Mars	E.	97 4 41	2204	95 16 20	2214	93 28 13	2223	91 40 19	2232
	Pollux	E.	97 59 11	2083	96 7 46	2091	94 16 33	2099	92 25 33	2109
	Venus	E.	108 45 3	2283	106 58 39	2293	105 12 29	2302	103 26 33	2313
11	Saturn	W.	119 42 11	2101	121 33 9	2113	123 23 48	2127	125 14 6	2141
	Fomalhaut	W.	59 43 14	2738	61 19 3	2729	62 55 5	2722	64 31 16	2718
	a Pegasi	W.	38 57 36	2460	40 39 45	2445	42 22 15	2436	44 4 58	2431
	Aldebaran	E.	40 56 38	2137	39 6 36	2154	37 16 59	2172	35 27 49	2190
	Mars	E.	82 44 51	2292	80 58 40	2306	79 12 50	2320	77 27 20	2334
	Pollux	E.	83 14 32	2167	81 25 15	2181	79 36 19	2195	77 47 44	2210
	Venus	E.	94 41 3	2376	92 56 54	2390	91 13 5	2405	89 29 37	2420
12	Fomalhaut	W.	72 32 37	2727	74 8 41	2734	75 44 36	2741	77 20 21	2751
	a Pegasi	W.	52 39 34	2431	54 22 20	2440	56 4 58	2448	57 47 25	2456
	Mars	E.	68 45 20	2415	67 2 6	2432	65 19 17	2449	63 36 52	2467
	Pollux	E.	68 50 39	2293	67 4 29	2311	65 18 46	2330	63 33 30	2349
	Venus	E.	80 57 53	2502	79 16 43	2520	77 35 58	2538	75 55 37	2555
	Regulus	E.	105 29 40	2231	103 41 59	2247	101 54 41	2262	100 7 46	2279
13	Fomalhaut	W.	85 15 26	2815	86 49 34	2831	88 23 22	2847	89 56 49	2864
	a Pegasi	W.	66 16 18	2511	67 57 16	2525	69 37 55	2538	71 18 16	2552
	Pollux	E.	54 54 20	2453	53 12 0	2475	51 30 12	2498	49 48 56	2521
	Mars	E.	55 11 7	2559	53 31 16	2577	51 51 50	2596	50 12 51	2615
	Venus	E.	67 40 9	2649	66 2 20	2668	64 24 57	2687	62 47 59	2706
	Regulus	E.	91 19 15	2363	89 34 47	2380	87 50 44	2397	86 7 5	2415
	Sun	E.	113 34 47	2675	111 57 34	2694	110 20 46	2713	108 44 23	2731
14	Fomalhaut	W.	97 38 12	2962	99 9 12	2984	100 39 45	3006	102 9 51	3028
	a Arietis	W.	35 58 48	2585	37 38 3	2594	39 17 6	2605	40 55 54	2616
	Pollux	E.	41 31 6	2652	39 53 22	2682	38 16 18	2713	36 39 55	2745
	Mars	E.	42 4 27	2714	40 28 6	2734	38 52 12	2754	37 16 44	2775
	Venus	E.	54 49 32	2801	53 15 6	2820	51 41 4	2839	50 7 27	2858
	Regulus	E.	77 35 1	2501	75 53 49	2519	74 13 2	2336	72 32 39	2553
	Sun	E.	100 48 26	2821	99 14 26	2840	97 40 50	2858	96 7 37	2876
15	a Arietis	W.	49 6 0	2676	50 43 12	2689	52 20 7	2701	53 56 45	2714
	Pollux	E.	28 49 57	2958	27 18 51	3015	25 48 57	3077	24 20 19	3145
	Mars	E.	29 26 15	2883	27 53 35	2906	26 21 24	2931	24 49 44	2958
	Venus	E.	42 25 20	2950	40 54 4	2968	39 23 11	2985	37 52 39	3003
	Regulus	E.	64 16 32	2637	62 38 27	2653	61 0 44	2669	59 23 23	2685
	Sun	E.	88 27 11	2962	86 56 11	2980	85 25 33	2997	83 55 16	3014
16	a Arietis	W.	61 55 42	2777	63 30 40	2789	65 5 21	2801	66 39 47	2813
	Aldebaran	W.	28 48 43	2803	30 23 7	2809	31 57 23	2817	33 31 29	2825
	Venus	E.	30 25 29	3089	28 57 6	3107	27 29 5	3124	26 1 24	3139
	Regulus	E.	51 21 54	2763	49 46 38	2779	48 11 42	2793	46 37 5	2808
	Sun	E.	76 28 49	3091	75 0 28	3106	73 32 26	3120	72 4 41	3135
17	a Arietis	W.	74 28 11	2870	76 1 8	2880	77 33 52	2891	79 6 23	2901

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
17	Aldebaran	W.	35 5 25	2834	36 39 9	2842	38 12 42	2851	39 46 3	2859
	Regulus	E.	45 2 48	2823	43 28 50	2838	41 55 12	2853	40 21 53	2867
	Sun	E.	70 37 14	3148	69 10 3	3163	67 43 9	3177	66 16 32	3189
18	*a* Arietis	W.	80 38 41	2911	82 10 46	2921	83 42 38	2930	85 14 19	2939
	Aldebaran	W.	47 30 3	2905	49 2 16	2912	50 34 19	2921	52 6 11	2928
	Sun	E.	59 7 9	3250	57 41 59	3262	56 17 3	3273	54 52 20	3283
19	*a* Arietis	W.	92 49 56	2981	94 20 32	2989	95 50 58	2997	97 21 15	3005
	Aldebaran	W.	59 43 5	2967	61 13 59	2973	62 44 45	2980	64 15 22	2986
	Pollux	W.	19 56 15	3603	21 14 46	3526	22 34 41	3464	23 55 45	3415
	Sun	E.	47 51 47	3335	46 28 16	3344	45 4 55	3353	43 41 45	3362
20	*a* Arietis	W.	104 50 25	3038	106 19 51	3044	107 49 9	3050	109 18 20	3056
	Aldebaran	W.	71 46 33	3017	73 16 25	3022	74 46 11	3026	76 15 51	3031
	Pollux	W.	30 52 16	3270	32 17 2	3253	33 42 8	3241	35 7 29	3229
	Sun	E.	36 48 28	3407	35 26 19	3415	34 4 19	3423	32 42 29	3433
21	Aldebaran	W.	83 42 47	3052	85 11 55	3056	86 40 59	3060	88 9 58	3063
	Pollux	W.	42 17 4	3192	43 43 22	3187	45 9 47	3183	46 36 16	3181
	Sun	E.	25 56 2	3484	24 35 20	3497	23 14 52	3510	21 54 39	3525
25	Sun	W.	18 26 39	3573	19 45 43	3554	21 5 8	3538	22 24 50	3525
	Antares	E.	48 11 36	3096	46 43 22	3096	45 15 7	3096	43 46 52	3095
	Saturn	E.	68 52 10	3087	67 23 45	3085	65 55 17	3082	64 26 45	3079
	a Aquilæ	E.	100 41 52	3509	99 21 38	3504	98 1 18	3498	96 40 51	3493
26	Sun	W.	29 6 35	3474	30 27 28	3465	31 48 31	3458	33 9 42	3451
	Antares	E.	36 25 27	3093	34 57 9	3093	33 28 51	3093	32 0 33	3093
	Saturn	E.	57 3 7	3061	55 34 10	3057	54 5 7	3053	52 36 0	3048
	a Aquilæ	E.	89 57 22	3472	88 36 27	3469	87 15 29	3466	85 54 27	3463
	Fomalhaut	E.	117 10 56	3650	115 53 16	3632	114 35 16	3615	113 16 58	3598
27	Sun	W.	39 57 49	3411	41 19 53	3402	42 42 7	3394	44 4 30	3387
	Saturn	E.	45 9 2	3025	43 39 20	3020	42 9 32	3014	40 39 36	3008
	a Aquilæ	E.	79 8 40	3455	77 47 26	3454	76 26 11	3454	75 4 55	3454
	Fomalhaut	E.	106 41 3	3524	105 21 5	3510	104 0 52	3497	102 40 25	3485
28	Sun	W.	50 58 47	3342	52 22 10	3332	53 45 44	3322	55 9 30	3313
	Saturn	E.	33 7 58	2973	31 37 12	2966	30 6 17	2958	28 35 11	2950
	a Aquilæ	E.	68 18 49	3463	66 57 43	3466	65 36 40	3470	64 15 42	3475
	Fomalhaut	E.	95 54 56	3431	94 33 14	3420	93 11 20	3410	91 49 15	3400
29	Sun	W.	62 11 23	3257	63 36 25	3245	65 1 41	3232	66 27 12	3219
	Saturn	E.	20 57 4	2906	19 24 52	2898	17 52 30	2891	16 19 59	2883
	a Aquilæ	E.	57 32 41	3517	56 12 36	3530	54 52 45	3544	53 33 9	3562
	Fomalhaut	E.	84 56 15	3358	83 33 10	3350	82 9 56	3342	80 46 33	3335
30	Sun	W.	73 38 44	3151	75 5 52	3136	76 33 18	3120	78 1 3	3105
	Jupiter	W.	13 57 19	2842	15 30 53	2828	17 4 45	2813	18 38 56	2799
	a Aquilæ	E.	47 0 47	3688	45 43 47	3726	44 27 27	3768	43 11 51	3817
	Fomalhaut	E.	73 47 48	3306	72 23 44	3302	70 59 36	3299	69 35 23	3297

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV$^{\text{h}}$.	P. L. of Diff.	XVIII$^{\text{h}}$.	P. L. of Diff.	XXI$^{\text{h}}$.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
17	Aldebaran	W.	41 19 14	2868	42 52 14	2877	44 25 2	2886	45 57 38	2895
	Regulus	E.	38 48 52	2883	37 16 11	2898	35 43 49	2912	34 11 46	2929
	SUN	E.	64 50 10	3202	63 24 3	3214	61 58 11	3226	60 32 33	3238
18	*a* Arietis	W.	86 45 48	2948	88 17 6	2957	89 48 13	2965	91 19 10	2973
	Aldebaran	W.	53 37 54	2937	55 9 26	2945	56 40 48	2952	58 12 1	2959
	SUN	E.	53 27 49	3294	52 3 31	3305	50 39 25	3314	49 15 30	3325
19	*a* Arietis	W.	98 51 22	3011	100 21 21	3019	101 51 10	3026	103 20 51	3031
	Aldebaran	W.	65 45 52	2993	67 16 13	2999	68 46 27	3005	70 16 33	3011
	Pollux	W.	25 17 45	3373	26 40 32	3341	28 3 56	3313	29 27 53	3290
	SUN	E.	42 18 45	3371	40 55 55	3380	39 33 16	3389	38 10 47	3398
20	*a* Arietis	W.	110 47 23	3062	112 16 19	3067	113 45 9	3073	115 13 52	3078
	Aldebaran	W.	77 45 25	3036	79 14 53	3040	80 44 16	3044	82 13 34	3048
	Pollux	W.	36 33 4	3219	37 58 50	3210	39 24 47	3204	40 50 52	3198
	SUN	E.	31 20 50	3442	29 59 21	3452	28 38 3	3462	27 16 57	3472
21	Aldebaran	W.	89 38 52	3066	91 7 43	3069	92 36 30	3071	94 5 14	3073
	Pollux	W.	48 2 48	3178	49 29 24	3175	50 56 3	3173	52 22 45	3171
	SUN	E.	20 34 43	3543	19 15 6	3564	17 55 52	3588	16 37 5	3619
25	SUN	W.	23 44 47	3513	25 4 57	3503	26 25 19	3493	27 45 52	3482
	Antares	E.	42 18 36	3095	40 50 20	3094	39 22 3	3093	37 53 45	3093
	SATURN	E.	62 58 10	3076	61 29 31	3073	60 0 48	3069	58 32 0	3065
	a Aquilæ	E.	95 20 19	3488	93 59 42	3484	92 39 0	3480	91 18 13	3476
26	SUN	W.	34 31 1	3442	35 52 30	3434	37 14 8	3427	38 35 54	3419
	Antares	E.	30 32 17	3096	29 4 3	3098	27 35 51	3101	26 7 42	3104
	SATURN	E.	51 6 47	3044	49 37 29	3040	48 8 6	3035	46 38 37	3030
	a Aquilæ	E.	84 33 22	3462	83 12 15	3459	81 51 5	3457	80 29 53	3456
	Fomalhaut	E.	111 58 21	3581	110 39 26	3566	109 20 15	3551	108 0 47	3537
27	SUN	W.	45 27 1	3379	46 49 42	3370	48 12 33	3360	49 35 35	3351
	SATURN	E.	39 9 33	3001	37 39 22	2995	36 9 3	2988	34 38 35	2981
	a Aquilæ	E.	73 43 39	3454	72 22 24	3456	71 1 11	3457	69 39 59	3459
	Fomalhaut	E.	101 19 44	3474	99 58 51	3463	98 37 45	3452	97 16 27	3440
28	SUN	W.	56 33 27	3301	57 57 37	3291	59 21 59	3279	60 46 35	3268
	SATURN	E.	27 3 55	2941	25 32 28	2933	24 0 51	2924	22 29 3	2916
	a Aquilæ	E.	62 54 50	3481	61 34 5	3488	60 13 27	3497	58 52 59	3506
	Fomalhaut	E.	90 26 59	3392	89 4 33	3383	87 41 57	3374	86 19 11	3365
29	SUN	W.	67 52 59	3206	69 19 1	3193	70 45 19	3179	72 11 53	3165
	SATURN	E.	14 47 18	2876	13 14 29	2871	11 41 34	2866	10 8 32	2861
	a Aquilæ	E.	52 13 53	3582	50 54 59	3603	49 36 28	3627	48 18 23	3654
	Fomalhaut	E.	79 23 2	3329	77 59 24	3323	76 35 39	3317	75 11 47	3311
30	SUN	W.	79 29 6	3090	80 57 28	3074	82 26 9	3058	83 55 10	3041
	JUPITER	W.	20 13 25	2785	21 48 13	2770	23 23 20	2755	24 58 47	2740
	a Aquilæ	E.	41 57 5	3871	40 43 16	3934	39 30 31	4006	38 18 57	4089
	Fomalhaut	E.	68 11 8	3295	66 46 51	3294	65 22 33	3294	63 58 16	3294

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	12 28 47.01	9.055	S. 3 6 37.0	−58.28	16 0.10	64.26	10 14.24	0.801
Tues.	2	12 32 24.43	9.067	3 29 54.4	58.18	16 0.37	64.30	10 33.32	0.789
Wed.	3	12 36 2.13	9.079	3 53 9.3	58.07	16 0.65	64.35	10 52.12	0.777
Thur.	4	12 39 40.12	9.092	4 16 21.3	−57.95	16 0.93	64.40	11 10.63	0.764
Frid.	5	12 43 18.47	9.106	4 39 30.3	57.81	16 1.20	64.45	11 28.80	0.750
Sat.	6	12 46 57.16	9.121	5 2 35.8	57.66	16 1.48	64.51	11 46.62	0.735
SUN.	7	12 50 36.22	9.137	5 25 37.5	−57.50	16 1.75	64.57	12 4.06	0.719
Mon.	8	12 54 15.68	9.155	5 48 35.1	57.32	16 2.03	64.63	12 21.09	0.702
Tues.	9	12 57 55.57	9.173	6 11 28.3	57.12	16 2.31	64.70	12 37.71	0.683
Wed.	10	13 1 35.91	9.192	6 34 16.5	−56.91	16 2.58	64.77	12 53.88	0.663
Thur.	11	13 5 16.72	9.212	6 56 59.6	56.69	16 2.86	64.84	13 9.58	0.643
Frid.	12	13 8 58.04	9.234	7 19 37.2	56.45	16 3.13	64.91	13 24.78	0.622
Sat.	13	13 12 39.87	9.256	7 42 8.8	−56.19	16 3.41	64.99	13 39.46	0.601
SUN.	14	13 16 22.24	9.279	8 4 34.2	55.92	16 3.68	65.06	13 53.62	0.578
Mon.	15	13 20 5.16	9.303	8 26 52.9	55.64	16 3.96	65.14	14 7.21	0.554
Tues.	16	13 23 48.67	9.327	8 49 4.7	−55.34	16 4.23	65.22	14 20.21	0.530
Wed.	17	13 27 32.78	9.352	9 11 9.0	55.02	16 4.51	65.30	14 32.64	0.505
Thur.	18	13 31 17.48	9.377	9 33 5.4	54.68	16 4.78	65.39	14 44.45	0.479
Frid.	19	13 35 2.80	9.403	9 54 53.6	−54.33	16 5.05	65.48	14 55.64	0.453
Sat.	20	13 38 48.77	9.430	10 16 33.2	53.96	16 5.32	65.57	15 6.20	0.426
SUN.	21	13 42 35.38	9.458	10 38 3.8	53.57	16 5.59	65.66	15 16.11	0.399
Mon.	22	13 46 22.68	9.487	10 59 24.8	−53.17	16 5.86	65.76	15 25.35	0.371
Tues.	23	13 50 10.64	9.516	11 20 36.0	52.75	16 6.12	65.86	15 33.91	0.343
Wed.	24	13 53 59.30	9.545	11 41 36.9	52.32	16 6.39	65.96	15 41.79	0.314
Thur.	25	13 57 48.66	9.574	12 2 27.2	−51.87	16 6.65	66.06	15 48.96	0.284
Frid.	26	14 1 38.73	9.603	12 23 6.4	51.40	16 6.91	66.17	15 55.42	0.254
Sat.	27	14 5 29.52	9.633	12 43 34.0	50.91	16 7.17	66.28	16 1.16	0.224
SUN.	28	14 9 21.04	9.663	13 3 49.8	−50.41	16 7.43	66.39	16 6.18	0.193
Mon.	29	14 13 13.31	9.694	13 23 53.2	49.89	16 7.69	66.50	16 10.45	0.162
Tues.	30	14 17 6.33	9.726	13 43 43.9	49.34	16 7.95	66.61	16 13.97	0.131
Wed.	31	14 21 0.11	9.758	14 3 21.4	48.78	16 8.20	66.72	16 16.74	0.099
Thur.	32	14 24 54.66	9.790	S. 14 22 45.4	−48.21	16 8.45	66.83	16 18.74	0.067

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^s.18$ from the sidereal time.

The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

		THE SUN'S						
Day of the Week.	Day of the Month.	Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff for 1 Hour.	Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	12 28 48.56	9.055	S. 3 6 46.9	−58.28	10 14.38	0.801	12 39 2.94
Tues.	2	12 32 26.03	9.067	3 30 4.6	58.18	10 33.46	0.789	12 42 59.49
Wed.	3	12 36 3.78	9.079	3 53 19.8	58.07	10 52.27	0.777	12 46 56.04
Thur.	4	12 39 41.82	9.092	4 16 32.1	−57.95	11 10.77	0.764	12 50 52.60
Frid.	5	12 43 20.21	9.106	4 39 41.4	57.81	11 28.94	0.750	12 54 49.15
Sat.	6	12 46 58.95	9.121	5 2 47.2	57.66	11 46.75	0.735	12 58 45.70
SUN.	7	12 50 38.06	9.137	5 25 49.1	−57.50	12 4.20	0.719	13 2 42.25
Mon.	8	12 54 17.57	9.155	5 48 46.9	57.32	12 21.23	0.702	13 6 38.81
Tues.	9	12 57 57.50	9.173	6 11 40.3	57.12	12 37.85	0.683	13 10 35.36
Wed.	10	13 1 37.89	9.192	6 34 28.7	−56.91	12 54.02	0.663	13 14 31.91
Thur.	11	13 5 18.74	9.212	6 57 12.0	56.69	13 9.72	0.643	13 18 28.46
Frid.	12	13 9 0.10	9.234	7 19 49.8	56.45	13 24.92	0.622	13 22 25.02
Sat.	13	13 12 41.97	9.256	7 42 21.6	−56.19	13 39.60	0.601	13 26 21.57
SUN.	14	13 16 24.38	9.279	8 4 47.2	55.92	13 53.75	0.578	13 30 18.12
Mon.	15	13 20 7.34	9.303	8 27 6.0	55.64	14 7.34	0.554	13 34 14.68
Tues.	16	13 23 50.88	9.327	8 49 17.9	−55.34	14 20.34	0.530	13 38 11.23
Wed.	17	13 27 35.02	9.352	9 11 22.3	55.02	14 32.76	0.505	13 42 7.78
Thur.	18	13 31 19.76	9.377	9 33 18.8	54.68	14 44.57	0.479	13 46 4.34
Frid.	19	13 35 5.12	9.403	9 55 7.1	−54.33	14 55.77	0.453	13 50 0.89
Sat.	20	13 38 51.13	9.430	10 16 46.8	53.96	15 6.31	0.426	13 53 57.44
SUN.	21	13 42 37.78	9.458	10 38 17.4	53.57	15 16.21	0.399	13 57 54.00
Mon.	22	13 46 25.11	9.487	10 59 38.5	−53.17	15 25.44	0.371	14 1 50.55
Tues.	23	13 50 13.10	9.516	11 20 49.7	52.75	15 34.00	0.343	14 5 47.10
Wed.	24	13 54 1.79	9.545	11 41 50.6	52.32	15 41.87	0.314	14 9 43.66
Thur.	25	13 57 51.18	9.574	12 2 40.9	−51.87	15 49.03	0.284	14 13 40.21
Frid.	26	14 1 41.28	9.603	12 23 20.0	51.39	15 55.49	0.254	14 17 36.76
Sat.	27	14 5 32.10	9.633	12 43 47.6	50.90	16 1.22	0.224	14 21 33.32
SUN.	28	14 9 23.64	9.663	13 4 3.3	−50.40	16 6.23	0.193	14 25 29.87
Mon.	29	14 13 15.93	9.694	13 24 6.6	49.88	16 10.49	0.162	14 29 26.43
Tues.	30	14 17 8.97	9.726	13 43 57.2	49.33	16 14.01	0.131	14 33 22.98
Wed.	31	14 21 2.77	9.758	14 3 34.6	48.77	16 16.77	0.099	14 37 19.53
Thur.	32	14 24 57.33	9.790	S. 14 22 58.5	−48.20	16 18.76	0.067	14 41 16.09

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,
$+9^s.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S							Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.		
		TRUE LONGITUDE.					Diff. for 1 Hour.	LATITUDE.					
		λ			λ'								
		°	'	"	'	"	"	"			h	m	s
1	274	187	50	55.5	50	2.6	147.62	+ 0.17	0.0003049	−53.3	11	19	5.50
2	275	188	49	59.3	49	6.3	147.69	0.27	0.0001768	53.4	11	15	9.60
3	276	189	49	4.8	48	11.7	147.77	0.34	0.0000486	53.4	11	11	13.69
4	277	190	48	11.9	47	18.7	147.84	+ 0.38	9.9999206	−53.3	11	7	17.78
5	278	191	47	21.0	46	27.7	147.92	0.40	9.9997928	53.1	11	3	21.88
6	279	192	46	31.9	45	38.5	147.99	0.40	9.9996656	52.9	10	59	25.97
7	280	193	45	44.6	44	51.1	148.07	+ 0.35	9.9995390	−52.6	10	55	30.06
8	281	194	44	59.3	44	5.8	148.15	0.28	9.9994131	52.3	10	51	34.16
9	282	195	44	16.0	43	22.4	148.24	0.17	9.9992880	52.0	10	47	38.25
10	283	196	43	34.9	42	41.2	148.33	+ 0.04	9.9991637	−51.6	10	43	42.34
11	284	197	42	56.0	42	2.2	148.42	— 0.10	9.9990402	51.3	10	39	46.44
12	285	198	42	19.3	41	25.4	148.52	0.23	9.9989174	51.0	10	35	50.53
13	286	199	41	44.9	40	50.9	148.62	— 0.37	9.9987954	−50.8	10	31	54.62
14	287	200	41	12.9	40	18.8	148.72	0.50	9.9986738	50.6	10	27	58.72
15	288	201	40	43.2	39	48.9	148.82	0.60	9.9985526	50.4	10	24	2.81
16	289	202	40	15.9	39	21.6	148.91	— 0.68	9.9984317	−50.3	10	20	6.90
17	290	203	39	50.8	38	56.4	149.01	0.74	9.9983112	50.2	10	16	11.00
18	291	204	39	28.0	38	33.5	149.10	0.76	9.9981908	50.1	10	12	15.09
19	292	205	39	7.4	38	12.8	149.19	— 0.77	9.9980706	−50.0	10	8	19.18
20	293	206	38	49.1	37	54.4	149.28	0.75	9.9979506	49.9	10	4	23.27
21	294	207	38	32.9	37	38.1	149.37	0.70	9.9978305	49.9	10	0	27.36
22	295	208	38	18.8	37	23.8	149.45	— 0.63	9.9977107	−49.9	9	56	31.46
23	296	209	38	6.7	37	11.6	149.54	0.54	9.9975909	49.9	9	52	35.55
24	297	210	37	56.6	37	1.4	149.62	0.43	9.9974713	49.8	9	48	39.64
25	298	211	37	48.4	36	53.1	149.70	— 0.31	9.9973518	−49.7	9	44	43.73
26	299	212	37	42.1	36	46.7	149.78	0.16	9.9972325	49.6	9	40	47.82
27	300	213	37	37.6	36	42.1	149.85	— 0.01	9.9971135	49.5	9	36	51.92
28	301	214	37	34.8	36	39.2	149.92	+ 0.11	9.9969949	−49.3	9	32	56.01
29	302	215	37	33.8	36	38.0	149.99	0.23	9.9968768	49.0	9	29	0.10
30	303	216	37	34.3	36	38.5	150.06	0.30	9.9967594	48.7	9	25	4.19
31	304	217	37	36.5	36	40.6	150.13	0.35	9.9966429	48.4	9	21	8.28
32	305	218	37	40.2	36	44.2	150.19	+ 0.39	9.9965272	−48.0	9	17	12.38

Note.—The numbers in column λ correspond to the true equinox of the date; in column λ' to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
—$9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 29.5	15 36.3	56 44.6	+2.04	57 9.8	+2.15	5 47.2	2.22	7.7
2	15 43.5	15 51.0	57 36.2	2.24	58 3.5	2.30	6 40.6	2.23	8.7
3	15 58.5	16 6.1	58 31.3	2.32	58 59.2	2.30	7 34.1	2.23	9.7
4	16 13.6	16 20.6	59 26.5	+2.22	59 52.5	+2.09	8 27.5	2.22	10.7
5	16 27.2	16 33.1	60 16.7	1.90	60 38.2	1.65	9 20.9	2.23	11.7
6	16 38.0	16 41.9	60 56.4	1.35	61 10.6	1.00	10 14.8	2.26	12.7
7	16 44.6	16 45.9	61 20.4	+0.61	61 25.2	+0.19	11 9.8	2.32	13.7
8	16 45.8	16 44.4	61 25.0	−0.23	61 19.7	−0.65	12 6.3	2.39	14.7
9	16 41.6	16 37.5	61 9.3	1.05	60 54.4	1.42	13 4.5	2.45	15.7
10	16 32.3	16 26.2	60 35.4	−1.73	60 12.9	−1.99	14 3.7	2.48	16.7
11	16 19.3	16 11.9	59 47.6	2.19	59 20.3	2.33	15 3.1	2.46	17.7
12	16 4.1	15 56.1	58 51.6	2.41	58 22.4	2.43	16 1.1	2.37	18.7
13	15 48.2	15 40.4	57 53.2	−2.41	57 24.6	−2.34	16 56.4	2.24	19.7
14	15 32.9	15 25.7	56 57.0	2.24	56 30.8	2.10	17 48.7	2.10	20.7
15	15 19.1	15 13.0	56 6.4	1.95	55 43.9	1.78	18 37.4	1.97	21.7
16	15 7.4	15 2.5	55 23.5	−1.60	55 5.4	−1.42	19 23.2	1.85	22.7
17	14 58.1	14 54.4	54 49.5	1.23	54 35.8	1.05	20 6.7	1.77	23.7
18	14 51.3	14 48.8	54 24.4	0.86	54 15.1	0.69	20 48.6	1.73	24.7
19	14 46.8	14 45.4	54 7.9	−0.52	54 2.6	−0.36	21 29.9	1.72	25.7
20	14 44.5	14 44.0	53 59.2	−0.21	53 57.5	−0.07	22 11.3	1.74	26.7
21	14 44.0	14 44.3	53 57.4	+0.05	53 58.8	+0.18	22 53.5	1.78	27.7
22	14 45.1	14 46.2	54 1.6	+0.29	54 5.8	+0.39	23 37.1	1.85	28.7
23	14 47.7	14 49.5	54 11.1	0.50	54 17.7	0.59	δ		29.7
24	14 51.6	14 54.0	54 25.3	0.68	54 34.1	0.78	0 22.5	1.94	0.9
25	14 56.7	14 59.6	54 44.0	+0.87	54 55.0	+0.96	1 10.1	2.02	1.9
26	15 2.9	15 6.6	55 7.1	1.06	55 20.4	1.16	1 59.6	2.10	2.9
27	15 10.5	15 14.8	55 34.9	1.26	55 50.6	1.36	2 50.8	2.15	3.9
28	15 19.4	15 24.3	56 7.6	+1.46	56 25.7	+1.56	3 42.8	2.18	4.9
29	15 29.6	15 35.2	56 45.1	1.66	57 5.6	1.75	4 35.0	2.17	5.9
30	15 41.1	15 47.1	57 27.1	1.83	57 49.4	1.88	5 27.0	2.15	6.9
31	15 53.4	15 59.7	58 12.3	1.91	58 35.5	1.93	6 18.5	2.14	7.9
32	16 6.0	16 12.1	58 58.6	+1.90	59 21.1	+1.83	7 9.7	2.14	8.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 1.					**WEDNESDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 13 53.20	2.2988	S.20 51 10.1	3.286	0	20 4 48.45	2.3127	S.15 58 54.6	8.777
1	18 16 11.16	2.2998	20 47 49.4	3.405	1	20 7 7.21	2.3126	15 50 4.9	8.881
2	18 18 29.18	2.3008	20 44 21.5	3.524	2	20 9 25.96	2.3123	15 41 8.9	8.985
3	18 20 47.25	2.3017	20 40 46.5	3.643	3	20 11 44.69	2.3121	15 32 6.7	9.088
4	18 23 5.38	2.3027	20 37 4.3	3.763	4	20 14 3.41	2.3119	15 22 58.4	9.190
5	18 25 23.57	2.3036	20 33 15.0	3.881	5	20 16 22.12	2.3117	15 13 43.9	9.292
6	18 27 41.81	2.3043	20 29 18.6	4.000	6	20 18 40.81	2.3114	15 4 23.4	9.393
7	18 30 0.09	2.3051	20 25 15.0	4.119	7	20 20 59.49	2.3112	14 54 56.8	9.493
8	18 32 18.42	2.3059	20 21 4.3	4.238	8	20 23 18.16	2.3110	14 45 24.2	9.593
9	18 34 36.80	2.3067	20 16 46.5	4.356	9	20 25 36.81	2.3108	14 35 45.7	9.691
10	18 36 55.22	2.3073	20 12 21.6	4.474	10	20 27 55.45	2.3106	14 26 1.3	9.789
11	18 39 13.68	2.3080	20 7 49.6	4.593	11	20 30 14.08	2.3103	14 16 11.0	9.887
12	18 41 32.18	2.3086	20 3 10.5	4.712	12	20 32 32.69	2.3101	14 6 14.9	9.983
13	18 43 50.71	2.3092	19 58 24.2	4.830	13	20 34 51.29	2.3099	13 56 13.1	10.078
14	18 46 9.28	2.3098	19 53 30.9	4.948	14	20 37 9.88	2.3097	13 46 5.5	10.173
15	18 48 27.88	2.3102	19 48 30.5	5.066	15	20 39 28.45	2.3094	13 35 52.3	10.267
16	18 50 46.50	2.3107	19 43 23.0	5.183	16	20 41 47.01	2.3092	13 25 33.5	10.360
17	18 53 5.16	2.3112	19 38 8.5	5.301	17	20 44 5.56	2.3090	13 15 9.1	10.453
18	18 55 23.84	2.3115	19 32 46.9	5.418	18	20 46 24.09	2.3088	13 4 39.2	10.544
19	18 57 42.54	2.3119	19 27 18.3	5.535	19	20 48 42.62	2.3087	12 54 3.8	10.634
20	19 0 1.27	2.3123	19 21 42.7	5.652	20	20 51 1.14	2.3086	12 43 23.1	10.723
21	19 2 20.02	2.3127	19 16 0.0	5.769	21	20 53 19.65	2.3084	12 32 37.0	10.812
22	19 4 38.79	2.3130	19 10 10.4	5.885	22	20 55 38.15	2.3083	12 21 45.6	10.900
23	19 6 57.58	2.3132	S.19 4 13.8	6.001	23	20 57 56.64	2.3081	S.12 10 49.0	10.987
	TUESDAY 2.					**THURSDAY 4.**			
0	19 9 16.38	2.3134	S.18 58 10.3	6.117	0	21 0 15.12	2.3080	S.11 59 47.2	11.073
1	19 11 35.19	2.3137	18 51 59.8	6.233	1	21 2 33.60	2.3079	11 48 40.3	11.158
2	19 13 54.02	2.3139	18 45 42.4	6.348	2	21 4 52.07	2.3078	11 37 28.3	11.241
3	19 16 12.86	2.3140	18 39 18.0	6.463	3	21 7 10.54	2.3078	11 26 11.4	11.323
4	19 18 31.70	2.3141	18 32 46.8	6.578	4	21 9 29.00	2.3077	11 14 49.5	11.406
5	19 20 50.55	2.3143	18 26 8.7	6.692	5	21 11 47.46	2.3077	11 3 22.7	11.487
6	19 23 9.41	2.3143	18 19 23.8	6.805	6	21 14 5.92	2.3077	10 51 51.1	11.566
7	19 25 28.27	2.3143	18 12 32.1	6.918	7	21 16 24.38	2.3077	10 40 14.7	11.644
8	19 27 47.13	2.3144	18 5 33.6	7.032	8	21 18 42.84	2.3077	10 28 33.7	11.722
9	19 30 6.00	2.3144	17 58 28.3	7.145	9	21 21 1.30	2.3078	10 16 48.0	11.799
10	19 32 24.86	2.3144	17 51 16.2	7.257	10	21 23 19.77	2.3078	10 4 57.8	11.874
11	19 34 43.73	2.3144	17 43 57.4	7.368	11	21 25 38.24	2.3078	9 53 3.1	11.948
12	19 37 2.59	2.3143	17 36 32.0	7.480	12	21 27 56.71	2.3079	9 41 4.0	12.022
13	19 39 21.45	2.3143	17 28 59.8	7.592	13	21 30 15.19	2.3081	9 29 0.5	12.093
14	19 41 40.31	2.3142	17 21 21.0	7.702	14	21 32 33.68	2.3083	9 16 52.8	12.163
15	19 43 59.16	2.3141	17 13 35.6	7.812	15	21 34 52.18	2.3084	9 4 40.9	12.233
16	19 46 18.00	2.3140	17 5 43.6	7.921	16	21 37 10.69	2.3086	8 52 24.8	12.303
17	19 48 36.84	2.3139	16 57 45.1	8.030	17	21 39 29.21	2.3088	8 40 4.6	12.369
18	19 50 55.67	2.3138	16 49 40.0	8.138	18	21 41 47.75	2.3092	8 27 40.5	12.434
19	19 53 14.49	2.3136	16 41 28.5	8.246	19	21 44 6.31	2.3094	8 15 12.5	12.499
20	19 55 33.30	2.3134	16 33 10.5	8.353	20	21 46 24.88	2.3097	8 2 40.6	12.563
21	19 57 52.10	2.3133	16 24 46.0	8.460	21	21 48 43.47	2.3100	7 50 4.9	12.626
22	20 0 10.90	2.3132	16 16 15.2	8.566	22	21 51 2.08	2.3103	7 37 25.5	12.687
23	20 2 29.68	2.3129	16 7 38.1	8.672	23	21 53 20.71	2.3108	7 24 42.5	12.747
24	20 4 48.45	2.3127	S.15 58 54.6	8.777	24	21 55 39.37	2.3113	S. 7 11 55.9	12.805

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 5.					SUNDAY 7.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 55 39.37	2.3113	S. 7 11 55.9	12.805	0	23 47 44.19	2.3726	N. 3 42 0.8	13.827
1	21 57 58.06	2.3117	6 59 5.9	12.862	1	23 50 6.61	2.3747	3 55 49.8	13.807
2	22 0 16.77	2.3121	6 46 12.5	12.917	2	23 52 29.15	2.3768	4 9 37.6	13.786
3	22 2 35.51	2.3127	6 33 15.9	12.971	3	23 54 51.82	2.3790	4 23 24.1	13.763
4	22 4 54.29	2.3133	6 20 16.0	13.024	4	23 57 14.63	2.3813	4 37 9.1	13.737
5	22 7 13.10	2.3138	6 7 13.0	13.076	5	23 59 37.57	2.3835	4 50 52.5	13.709
6	22 9 31.95	2.3145	5 54 6.9	13.127	6	0 2 0.65	2.3858	5 4 34.2	13.680
7	22 11 50.84	2.3151	5 40 57.8	13.175	7	0 4 23.87	2.3881	5 18 14.1	13.650
8	22 14 9.76	2.3158	5 27 45.9	13.222	8	0 6 47.22	2.3903	5 31 52.2	13.618
9	22 16 28.73	2.3165	5 14 31.2	13.268	9	0 9 10.71	2.3927	5 45 28.2	13.583
10	22 18 47.74	2.3173	5 1 13.7	13.313	10	0 11 34.35	2.3952	5 59 2.1	13.547
11	22 21 6.80	2.3180	4 47 53.6	13.356	11	0 13 58.13	2.3975	6 12 33.8	13.509
12	22 23 25.90	2.3188	4 34 31.0	13.398	12	0 16 22.05	2.3999	6 26 3.2	13.469
13	22 25 45.05	2.3197	4 21 5.9	13.438	13	0 18 46.12	2.4023	6 39 30.1	13.428
14	22 28 4.26	2.3206	4 7 38.5	13.476	14	0 21 10.33	2.4048	6 52 54.5	13.384
15	22 30 23.52	2.3215	3 54 8.8	13.513	15	0 23 34.70	2.4073	7 6 16.2	13.339
16	22 32 42.84	2.3225	3 40 36.9	13.549	16	0 25 59.21	2.4098	7 19 35.2	13.292
17	22 35 2.22	2.3235	3 27 2.9	13.583	17	0 28 23.87	2.4123	7 32 51.3	13.243
18	22 37 21.66	2.3246	3 13 26.9	13.616	18	0 30 48.69	2.4149	7 46 4.4	13.193
19	22 39 41.17	2.3257	2 59 49.0	13.647	19	0 33 13.66	2.4174	7 59 14.5	13.141
20	22 42 0.74	2.3267	2 46 9.3	13.676	20	0 35 38.78	2.4199	8 12 21.3	13.087
21	22 44 20.37	2.3278	2 32 27.9	13.703	21	0 38 4.05	2.4225	8 25 24.9	13.032
22	22 46 40.08	2.3291	2 18 44.9	13.730	22	0 40 29.48	2.4252	8 38 25.1	12.973
23	22 48 59.86	2.3303	S. 2 5 0.3	13.755	23	0 42 55.07	2.4278	N. 8 51 21.7	12.913
SATURDAY 6.					MONDAY 8.				
0	22 51 19.71	2.3315	S. 1 51 14.3	13.778	0	0 45 20.81	2.4303	N. 9 4 14.7	12.852
1	22 53 39.64	2.3328	1 37 26.8	13.800	1	0 47 46.71	2.4329	9 17 4.0	12.789
2	22 55 59.65	2.3341	1 23 38.2	13.819	2	0 50 12.76	2.4355	9 29 49.4	12.724
3	22 58 19.73	2.3354	1 9 48.5	13.838	3	0 52 38.97	2.4382	9 42 30.9	12.658
4	23 0 39.90	2.3369	0 55 57.7	13.854	4	0 55 5.34	2.4408	9 55 8.4	12.590
5	23 3 0.16	2.3384	0 42 6.0	13.869	5	0 57 31.87	2.4435	10 7 41.7	12.519
6	23 5 20.51	2.3398	0 28 13.4	13.883	6	0 59 58.56	2.4461	10 20 10.7	12.448
7	23 7 40.94	2.3413	0 14 20.1	13.894	7	1 2 25.40	2.4487	10 32 35.4	12.375
8	23 10 1.47	2.3429	S. 0 0 26.1	13.904	8	1 4 52.40	2.4513	10 44 55.7	12.300
9	23 12 22.09	2.3445	N. 0 13 28.4	13.913	9	1 7 19.55	2.4538	10 57 11.4	12.223
10	23 14 42.81	2.3462	0 27 23.4	13.919	10	1 9 46.86	2.4565	11 9 22.5	12.144
11	23 17 3.63	2.3478	0 41 18.7	13.923	11	1 12 14.33	2.4591	11 21 28.8	12.064
12	23 19 24.55	2.3495	0 55 14.2	13.926	12	1 14 41.95	2.4617	11 33 30.2	11.983
13	23 21 45.57	2.3513	1 9 9.8	13.928	13	1 17 9.73	2.4643	11 45 26.7	11.899
14	23 24 6.70	2.3530	1 23 5.5	13.928	14	1 19 37.67	2.4669	11 57 18.1	11.813
15	23 26 27.93	2.3548	1 37 1.1	13.926	15	1 22 5.76	2.4695	12 9 4.3	11.727
16	23 28 49.27	2.3567	1 50 56.5	13.922	16	1 24 34.01	2.4721	12 20 45.3	11.638
17	23 31 10.73	2.3586	2 4 51.7	13.917	17	1 27 2.41	2.4746	12 32 20.9	11.548
18	23 33 32.30	2.3604	2 18 46.5	13.908	18	1 29 30.96	2.4771	12 43 51.1	11.458
19	23 35 53.98	2.3623	2 32 40.7	13.899	19	1 31 59.66	2.4797	12 55 15.8	11.364
20	23 38 15.78	2.3643	2 46 34.4	13.888	20	1 34 28.52	2.4822	13 6 34.8	11.269
21	23 40 37.70	2.3663	3 0 27.3	13.875	21	1 36 57.52	2.4846	13 17 48.1	11.173
22	23 42 59.74	2.3683	3 14 19.4	13.861	22	1 39 26.67	2.4871	13 28 55.6	11.076
23	23 45 21.90	2.3704	3 28 10.6	13.845	23	1 41 55.97	2.4895	13 39 57.2	10.977
24	23 47 44.19	2.3726	N. 3 42 0.8	13.827	24	1 44 25.41	2.4918	N. 13 50 52.8	10.876

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 9.					THURSDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 44 25.41	2.4918	N.13 50 52.8	10.876	0	3 45 53.48	2.5441	N.20 14 4.8	4.747
1	1 46 54.99	2.4943	14 1 42.3	10.774	1	3 48 26.10	2.5433	20 18 45.3	4.603
2	1 49 24.72	2.4967	14 12 25.7	10.671	2	3 50 58.68	2.5425	20 23 17.1	4.458
3	1 51 54.59	2.4989	14 23 2.8	10.565	3	3 53 31.20	2.5416	20 27 40.3	4.314
4	1 54 24.59	2.5011	14 33 33.5	10.458	4	3 56 3.67	2.5406	20 31 54.8	4.170
5	1 56 54.72	2.5033	14 43 57.8	10.352	5	3 58 36.07	2.5394	20 36 0.7	4.026
6	1 59 24.99	2 5056	14 54 15.7	10.243	6	4 1 8.40	2.5382	20 39 57.9	3.881
7	2 1 55.39	2.5078	15 4 26.9	10.132	7	4 3 40.65	2.5368	20 43 46.4	3.736
8	2 4 25.92	2.5098	15 14 31.5	10.020	8	4 6 12.82	2.5355	20 47 26.3	3.591
9	2 6 56.57	2.5119	15 24 29.3	9.907	9	4 8 44.91	2.5340	20 50 57.4	3.446
10	2 9 27.35	2.5140	15 34 20.3	9.793	10	4 11 16.90	2.5324	20 54 19.8	3.302
11	2 11 58.25	2.5159	15 44 4.4	9.677	11	4 13 48.80	2.5307	20 57 33.6	3.157
12	2 14 29.26	2.5178	15 53 41.5	9.560	12	4 16 20.59	2.5289	21 0 38.6	3.012
13	2 17 0.39	2.5198	16 3 11.6	9.442	13	4 18 52.27	2.5271	21 3 35.0	2.868
14	2 19 31.63	2.5216	16 12 34.5	9.322	14	4 21 23.84	2.5252	21 6 22.7	2.723
15	2 22 2.98	2.5234	16 21 50.2	9.202	15	4 23 55.29	2.5232	21 9 1.8	2.579
16	2 24 34.44	2.5252	16 30 58.7	9.081	16	4 26 26.62	2.5210	21 11 32.2	2.435
17	2 27 6.00	2.5268	16 39 59.9	8.957	17	4 28 57.81	2.5188	21 13 54.0	2.292
18	2 29 37.66	2.5285	16 48 53.6	8.833	18	4 31 28.87	2.5165	21 16 7.2	2.148
19	2 32 9.42	2.5301	16 57 39.9	8.709	19	4 33 59.79	2.5142	21 18 11.8	2.005
20	2 34 41.27	2.5315	17 6 18.7	8.583	20	4 36 30.57	2.5117	21 20 7.8	1.863
21	2 37 13.20	2.5329	17 14 49.9	8.457	21	4 39 1.19	2.5090	21 21 55.3	1.720
22	2 39 45.22	2.5343	17 23 13.5	8.328	22	4 41 31.65	2.5063	21 23 34.2	1.578
23	2 42 17.32	2.5357	N.17 31 29.3	8.199	23	4 44 1.95	2.5037	N.21 25 4.6	1.435
	WEDNESDAY 10.					FRIDAY 12.			
0	2 44 49.50	2.5369	N.17 39 37.5	8.070	0	4 46 32.09	2.5008	N.21 26 26.4	1.293
1	2 47 21.75	2.5381	17 47 37.8	7.939	1	4 49 2.05	2.4979	21 27 39.8	1.153
2	2 49 54.07	2.5393	17 55 30.2	7.808	2	4 51 31.84	2.4949	21 28 44.7	1.012
3	2 52 26.46	2.5403	18 3 14.7	7.675	3	4 54 1.44	2.4918	21 29 41.2	0.872
4	2 54 58.91	2.5413	18 10 51.2	7.542	4	4 56 30.85	2.4886	21 30 29.3	0.732
5	2 57 31.41	2.5422	18 18 19.7	7.408	5	4 59 0.07	2.4854	21 31 9.0	0.593
6	3 0 3.97	2.5430	18 25 40.1	7.273	6	5 1 29.10	2.4822	21 31 40.4	0.454
7	3 2 36.57	2.5438	18 32 52.4	7.138	7	5 3 57.93	2.4788	21 32 3.5	0.316
8	3 5 9.22	2.5444	18 39 56.6	7.002	8	5 6 26.55	2.4753	21 32 18.3	0.178
9	3 7 41.90	2.5450	18 46 52.6	6.864	9	5 8 54.96	2.4717	21 32 24.8	+ 0.040
10	3 10 14.62	2.5456	18 53 40.3	6.726	10	5 11 23.15	2.4681	21 32 23.1	− 0.096
11	3 12 47.37	2.5460	19 0 19.7	6.588	11	5 13 51.13	2.4644	21 32 13.3	0.231
12	3 15 20.14	2.5463	19 6 50.8	6.449	12	5 16 18.88	2.4606	21 31 55.4	0.367
13	3 17 52.93	2.5467	19 13 13.6	6.310	13	5 18 46.40	2.4568	21 31 29.3	0.502
14	3 20 25.74	2.5468	19 19 28.0	6.170	14	5 21 13.69	2.4528	21 30 55.2	0.635
15	3 22 58.55	2.5469	19 25 34.0	6.029	15	5 23 40.74	2.4488	21 30 13.1	0.768
16	3 25 31.37	2.5470	19 31 31.5	5.888	16	5 26 7.55	2.4448	21 29 23.0	0.902
17	3 28 4.19	2.5470	19 37 20.6	5.747	17	5 28 34.12	2.4408	21 28 24.9	1.033
18	3 30 37.01	2.5468	19 43 1.2	5.605	18	5 31 0.44	2.4366	21 27 19.0	1.164
19	3 33 9.81	2.5466	19 48 33.2	5.463	19	5 33 26.51	2.4323	21 26 5.2	1.294
20	3 35 42.60	2.5463	19 53 56.7	5.320	20	5 35 52.32	2.4281	21 24 43.7	1.423
21	3 38 15.36	2.5458	19 59 11.6	5.178	21	5 38 17.88	2.4238	21 23 14.4	1.553
22	3 40 48.10	2.5454	20 4 18.0	5.034	22	5 40 43.17	2.4193	21 21 37.4	1.681
23	3 43 20.81	2.5448	20 9 15.7	4.890	23	5 43 8.19	2.4148	21 19 52.7	1.808
24	3 45 53.48	2.5441	N.20 14 4.8	4.747	24	5 45 32.95	2.4103	N.21 18 0.4	1.934

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 13.					MONDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 45 32.95	2.4103	N.21 18 0.4	1.934	0	7 35 23.05	2.1607	N.17 36 54.3	6.907
1	5 47 57.43	2.4057	21 16 0.6	2.060	1	7 37 32.53	2.1554	17 29 57.5	6.986
2	5 50 21.63	2.4011	21 13 53.2	2.185	2	7 39 41.70	2.1502	17 22 56.0	7.064
3	5 52 45.56	2.3964	21 11 38.4	2.308	3	7 41 50.55	2.1449	17 15 49.8	7.142
4	5 55 9.20	2.3917	21 9 16.2	2.432	4	7 43 59.09	2.1398	17 8 38.9	7.219
5	5 57 32.56	2.3869	21 6 46.6	2.554	5	7 46 7.32	2.1346	17 1 23.5	7.295
6	5 59 55.63	2.3821	21 4 9.7	2.675	6	7 48 15.24	2.1294	16 54 3.5	7.370
7	6 2 18.41	2.3773	21 1 25.6	2.795	7	7 50 22.85	2.1243	16 46 39.1	7.443
8	6 4 40.90	2.3723	20 58 34.3	2.915	8	7 52 30.16	2.1193	16 39 10.3	7.517
9	6 7 3.09	2.3674	20 55 35.8	3.034	9	7 54 37.16	2.1142	16 31 37.1	7.589
10	6 9 24.99	2.3624	20 52 30.2	3.152	10	7 56 43.86	2.1092	16 23 59.5	7.660
11	6 11 46.58	2.3573	20 49 17.6	3.268	11	7 58 50.26	2.1042	16 16 17.8	7.729
12	6 14 7.87	2.3523	20 45 58.0	3.384	12	8 0 56.36	2.0992	16 8 32.0	7.798
13	6 16 28.86	2.3473	20 42 31.5	3.499	13	8 3 2.16	2.0943	16 0 42.0	7.867
14	6 18 49.54	2.3421	20 38 58.1	3.613	14	8 5 7.67	2.0893	15 52 47.9	7.935
15	6 21 9.91	2.3370	20 35 17.9	3.726	15	8 7 12.88	2.0844	15 44 49.8	8.001
16	6 23 29.98	2.3318	20 31 31.0	3.838	16	8 9 17.80	2.0796	15 36 47.8	8.067
17	6 25 49.73	2.3266	20 27 37.4	3.949	17	8 11 22.43	2.0748	15 28 41.8	8.132
18	6 28 9.17	2.3214	20 23 37.1	4.060	18	8 13 26.78	2.0701	15 20 32.0	8.195
19	6 30 28.30	2.3162	20 19 30.2	4.169	19	8 15 30.84	2.0653	15 12 18.4	8.258
20	6 32 47.11	2.3108	20 15 16.8	4.277	20	8 17 34.62	2.0606	15 4 1.0	8.321
21	6 35 5.60	2.3056	20 10 57.0	4.383	21	8 19 38.11	2.0559	14 55 39.9	8.382
22	6 37 23.78	2.3003	20 6 30.8	4.490	22	8 21 41.33	2.0513	14 47 15.2	8.442
23	6 39 41.64	2.2949	N.20 1 58.2	4.596	23	8 23 44.27	2.0467	N.14 38 46.9	8.502
	SUNDAY 14.					TUESDAY 16.			
0	6 41 59.17	2.2895	N.19 57 19.3	4.700	0	8 25 46.93	2.0421	N.14 30 15.0	8.560
1	6 44 16.38	2.2842	19 52 34.2	4.803	1	8 27 49.32	2.0377	14 21 39.7	8.618
2	6 46 33.27	2.2788	19 47 42.9	4.906	2	8 29 51.45	2.0333	14 13 0.9	8.675
3	6 48 49.84	2.2735	19 42 45.5	5.008	3	8 31 53.31	2.0288	14 4 18.7	8.731
4	6 51 6.09	2.2681	19 37 42.0	5.108	4	8 33 54.90	2.0243	13 55 33.2	8.786
5	6 53 22.01	2.2627	19 32 32.6	5.207	5	8 35 56.23	2.0200	13 46 44.4	8.841
6	6 55 37.61	2.2573	19 27 17.2	5.306	6	8 37 57.30	2.0158	13 37 52.3	8.894
7	6 57 52.88	2.2518	19 21 55.9	5.403	7	8 39 58.12	2.0115	13 28 57.1	8.947
8	7 0 7.83	2.2465	19 16 28.9	5.498	8	8 41 58.68	2.0073	13 19 58.7	8.998
9	7 2 22.46	2.2411	19 10 56.1	5.594	9	8 43 58.99	2.0031	13 10 57.3	9.049
10	7 4 36.76	2.2357	19 5 17.6	5.688	10	8 45 59.05	1.9990	13 1 52.8	9.100
11	7 6 50.74	2.2303	18 59 33.5	5.782	11	8 47 58.87	1.9949	12 52 45.3	9.149
12	7 9 4.39	2.2248	18 53 43.8	5.874	12	8 49 58.44	1.9908	12 43 34.9	9.198
13	7 11 17.72	2.2194	18 47 48.6	5.965	13	8 51 57.77	1.9868	12 34 21.6	9.245
14	7 13 30.72	2.2140	18 41 48.0	6.056	14	8 53 56.86	1.9829	12 25 5.5	9.292
15	7 15 43.40	2.2086	18 35 41.9	6.146	15	8 55 55.72	1.9790	12 15 46.5	9.339
16	7 17 55.75	2.2032	18 29 30.5	6.234	16	8 57 54.34	1.9752	12 6 24.8	9.384
17	7 20 7.78	2.1979	18 23 13.8	6.322	17	8 59 52.74	1.9714	11 57 0.4	9.428
18	7 22 19.50	2.1926	18 16 51.9	6.408	18	9 1 50.91	1.9677	11 47 33.4	9.473
19	7 24 30.89	2.1872	18 10 24.9	6.493	19	9 3 48.86	1.9639	11 38 3.7	9.516
20	7 26 41.96	2.1818	18 3 52.8	6.578	20	9 5 46.58	1.9603	11 28 31.5	9.558
21	7 28 52.71	2.1765	17 57 15.6	6.662	21	9 7 44.09	1.9568	11 18 56.7	9.600
22	7 31 3.14	2.1712	17 50 33.4	6.744	22	9 9 41.39	1.9532	11 9 19.5	9.641
23	7 33 13.25	2.1659	17 43 46.3	6.826	23	9 11 38.47	1.9496	10 59 39.8	9.681
24	7 35 23.05	2.1607	N.17 36 54.3	6.907	24	9 13 35.34	1.9462	N.10 49 57.8	9.719

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 17.					FRIDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 13 35.34	1.9462	N. 10 49 57.8	9.719	0	10 44 0.00	1.8412	N. 2 31 18.7	10.802
1	9 15 32.01	1.9427	10 40 13.5	9.758	1	10 45 50.44	1.8403	2 20 30.4	10.809
2	9 17 28.47	1.9393	10 30 26.7	9.797	2	10 47 40.83	1.8394	2 9 41.6	10.816
3	9 19 24.73	1.9361	10 20 37.8	9.834	3	10 49 31.17	1.8387	1 58 52.5	10.821
4	9 21 20.80	1.9328	10 10 46.6	9.871	4	10 51 21.47	1.8379	1 48 3.1	10.826
5	9 23 16.67	1.9296	10 0 53.3	9.906	5	10 53 11.72	1.8373	1 37 13.3	10.830
6	9 25 12.35	1.9264	9 50 57.9	9.941	6	10 55 1.94	1.8366	1 26 23.4	10.834
7	9 27 7.84	1.9233	9 41 0.4	9.976	7	10 56 52.11	1.8359	1 15 33.2	10.837
8	9 29 3.15	1.9203	9 31 0.8	10.009	8	10 58 42.25	1.8355	1 4 42.9	10.839
9	9 30 58.27	1.9173	9 20 59.3	10.042	9	11 0 32.37	1.8350	0 53 52.5	10.841
10	9 32 53.22	1.9143	9 10 55.8	10.074	10	11 2 22.45	1.8345	0 43 2.0	10.843
11	9 34 47.99	1.9114	9 0 50.4	10.106	11	11 4 12.51	1.8341	0 32 11.4	10.844
12	9 36 42.59	1.9086	8 50 43.1	10.137	12	11 6 2.54	1.8338	0 21 20.7	10.844
13	9 38 37.02	1.9058	8 40 34.0	10.167	13	11 7 52.56	1.8336	N. 0 10 30.1	10.843
14	9 40 31.29	1.9031	8 30 23.1	10.196	14	11 9 42.57	1.8333	S. 0 0 20.4	10.842
15	9 42 25.39	1.9003	8 20 10.5	10.224	15	11 11 32.56	1.8331	0 11 10.9	10.840
16	9 44 19.33	1.8977	8 9 56.2	10.252	16	11 13 22.54	1.8330	0 22 1.2	10.838
17	9 46 13.12	1.8952	7 59 40.3	10.279	17	11 15 12.52	1.8329	0 32 51.4	10.835
18	9 48 6.75	1.8926	7 49 22.7	10.307	18	11 17 2.49	1.8328	0 43 41.4	10.831
19	9 50 0.23	1.8902	7 39 3.5	10.333	19	11 18 52.46	1.8328	0 54 31.1	10.827
20	9 51 53.57	1.8878	7 28 42.8	10.358	20	11 20 42.43	1.8329	1 5 20.6	10.823
21	9 53 46.76	1.8853	7 18 20.6	10.383	21	11 22 32.41	1.8331	1 16 9.8	10.817
22	9 55 39.81	1.8830	7 7 56.9	10.407	22	11 24 22.40	1.8333	1 26 58.6	10.810
23	9 57 32.72	1.8808	N. 6 57 31.8	10.429	23	11 26 12.40	1.8334	S. 1 37 47.0	10.803
	THURSDAY 18.					SATURDAY 20.			
0	9 59 25.50	1.8785	N. 6 47 5.4	10.452	0	11 28 2.41	1.8337	S. 1 48 34.9	10.795
1	10 1 18.14	1.8763	6 36 37.6	10.474	1	11 29 52.44	1.8340	1 59 22.4	10.788
2	10 3 10.66	1.8743	6 26 8.5	10.495	2	11 31 42.49	1.8343	2 10 9.4	10.779
3	10 5 3.06	1.8723	6 15 38.2	10.516	3	11 33 32.56	1.8347	2 20 55.9	10.770
4	10 6 55.33	1.8702	6 5 6.6	10.536	4	11 35 22.65	1.8352	2 31 41.8	10.760
5	10 8 47.48	1.8683	5 54 33.9	10.555	5	11 37 12.78	1.8357	2 42 27.1	10.750
6	10 10 39.52	1.8663	5 44 0.0	10.574	6	11 39 2.93	1.8362	2 53 11.8	10.739
7	10 12 31.44	1.8644	5 33 25.0	10.592	7	11 40 53.12	1.8368	3 3 55.8	10.727
8	10 14 23.25	1.8627	5 22 49.0	10.609	8	11 42 43.35	1.8375	3 14 39.0	10.713
9	10 16 14.96	1.8610	5 12 11.9	10.627	9	11 44 33.62	1.8382	3 25 21.4	10.701
10	10 18 6.57	1.8593	5 1 33.8	10.643	10	11 46 23.93	1.8388	3 36 3.1	10.688
11	10 19 58.07	1.8576	4 50 54.8	10.658	11	11 48 14.28	1.8396	3 46 44.0	10.674
12	10 21 49.48	1.8560	4 40 14.9	10.673	12	11 50 4.68	1.8405	3 57 24.0	10.659
13	10 23 40.79	1.8544	4 29 34.1	10.687	13	11 51 55.14	1.8414	4 8 3.1	10.643
14	10 25 32.01	1.8530	4 18 52.5	10.700	14	11 53 45.65	1.8423	4 18 41.2	10.627
15	10 27 23.15	1.8517	4 8 10.1	10.713	15	11 55 36.21	1.8432	4 29 18.3	10.610
16	10 29 14.21	1.8503	3 57 27.0	10.725	16	11 57 26.83	1.8443	4 39 54.4	10.593
17	10 31 5.18	1.8488	3 46 43.1	10.737	17	11 59 17.52	1.8453	4 50 29.5	10.576
18	10 32 56.07	1.8476	3 35 58.5	10.748	18	12 1 8.27	1.8464	5 1 3.5	10.557
19	10 34 46.89	1.8464	3 25 13.3	10.759	19	12 2 59.09	1.8476	5 11 36.3	10.537
20	10 36 37.64	1.8453	3 14 27.4	10.769	20	12 4 49.98	1.8488	5 22 7.9	10.517
21	10 38 28.32	1.8442	3 3 41.0	10.778	21	12 6 40.94	1.8500	5 32 38.3	10.497
22	10 40 18.94	1.8432	2 52 54.1	10.787	22	12 8 31.98	1.8513	5 43 7.5	10.476
23	10 42 9.50	1.8422	2 42 6.6	10.795	23	12 10 23.09	1.8526	5 53 35.4	10.453
24	10 44 0.00	1.8412	N. 2 31 18.7	10.802	24	12 12 14.29	1.8540	S. 6 4 1.9	10.431

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
		SUNDAY 21.					TUESDAY 23.		
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 12 14.29	1.8540	S. 6 4 1.9	10.431	0	13 43 32.51	1.9634	S. 13 46 3.5	8.555
1	12 14 5.57	1.8553	6 14 27.1	10.408	1	13 45 30.41	1.9665	13 54 35.1	8.498
2	12 15 56.93	1.8568	6 24 50.8	10.383	2	13 47 28.49	1.9695	14 3 3.3	8.442
3	12 17 48.38	1.8583	6 35 13.1	10.359	3	13 49 26.75	1.9725	14 11 28.1	8.384
4	12 19 39.93	1.8599	6 45 33.9	10.334	4	13 51 25.19	1.9756	14 19 49.4	8.325
5	12 21 31.57	1.8614	6 55 53.2	10.308	5	13 53 23.82	1.9788	14 28 7.1	8.266
6	12 23 23.30	1.8630	7 6 10.9	10.282	6	13 55 22.64	1.9818	14 36 21.3	8.207
7	12 25 15.13	1.8647	7 16 27.0	10.255	7	13 57 21.64	1.9849	14 44 31.9	8.146
8	12 27 7.06	1.8664	7 26 41.5	10.227	8	13 59 20.83	1.9882	14 52 38.8	8.084
9	12 28 59.10	1.8682	7 36 54.3	10.198	9	14 1 20.22	1.9913	15 0 42.0	8.022
10	12 30 51.24	1.8699	7 47 5.3	10.169	10	14 3 19.79	1.9944	15 8 41.4	7.959
11	12 32 43.49	1.8718	7 57 14.6	10.140	11	14 5 19.55	1.9976	15 16 37.1	7.896
12	12 34 35.85	1.8736	8 7 22.1	10.110	12	14 7 19.50	2.0008	15 24 28.9	7.832
13	12 36 28.32	1.8755	8 17 27.8	10.078	13	14 9 19.65	2.0041	15 32 16.9	7.767
14	12 38 20.91	1.8775	8 27 31.5	10.047	14	14 11 19.99	2.0073	15 40 0.9	7.701
15	12 40 13.62	1.8794	8 37 33.4	10.014	15	14 13 20.52	2.0105	15 47 41.0	7.635
16	12 42 6.44	1.8814	8 47 33.2	9.981	16	14 15 21.25	2.0138	15 55 17.1	7.568
17	12 43 59.39	1.8835	8 57 31.1	9.948	17	14 17 22.18	2.0172	16 2 49.1	7.499
18	12 45 52.46	1.8856	9 7 27.0	9.913	18	14 19 23.31	2.0204	16 10 17.0	7.431
19	12 47 45.66	1.8878	9 17 20.7	9.878	19	14 21 24.63	2.0237	16 17 40.8	7.362
20	12 49 38.99	1.8899	9 27 12.3	9.842	20	14 23 26.15	2.0269	16 25 0.4	7.292
21	12 51 32.45	1.8921	9 37 1.7	9.805	21	14 25 27.86	2.0302	16 32 15.8	7.222
22	12 53 26.04	1.8943	9 46 48.9	9.768	22	14 27 29.77	2.0335	16 39 27.0	7.150
23	12 55 19.77	1.8966	S. 9 56 33.9	9.731	23	14 29 31.88	2.0368	S. 16 46 33.8	7.077
		MONDAY 22.					WEDNESDAY 24.		
0	12 57 13.63	1.8988	S. 10 6 16.6	9.692	0	14 31 34.19	2.0402	S. 16 53 36.2	7.003
1	12 59 7.63	1.9012	10 15 56.9	9.653	1	14 33 36.70	2.0435	17 0 34.2	6.930
2	13 1 1.77	1.9036	10 25 34.9	9.613	2	14 35 39.41	2.0468	17 7 27.8	6.857
3	13 2 56.06	1.9060	10 35 10.4	9.572	3	14 37 42.32	2.0502	17 14 17.0	6.782
4	13 4 50.49	1.9084	10 44 43.5	9.531	4	14 39 45.44	2.0536	17 21 1.6	6.705
5	13 6 45.07	1.9109	10 54 14.1	9.488	5	14 41 48.75	2.0568	17 27 41.6	6.628
6	13 8 39.80	1.9134	11 3 42.2	9.445	6	14 43 52.26	2.0602	17 34 17.0	6.552
7	13 10 34.68	1.9159	11 13 7.6	9.402	7	14 45 55.97	2.0635	17 40 47.9	6.474
8	13 12 29.71	1.9185	11 22 30.4	9.358	8	14 47 59.88	2.0668	17 47 14.0	6.395
9	13 14 24.90	1.9212	11 31 50.6	9.313	9	14 50 3.99	2.0702	17 53 35.3	6.316
10	13 16 20.25	1.9238	11 41 8.0	9.268	10	14 52 8.30	2.0734	17 59 51.9	6.236
11	13 18 15.75	1.9264	11 50 22.7	9.222	11	14 54 12.80	2.0768	18 6 3.6	6.155
12	13 20 11.42	1.9292	11 59 34.6	9.174	12	14 56 17.51	2.0802	18 12 10.5	6.074
13	13 22 7.25	1.9318	12 8 43.6	9.127	13	14 58 22.42	2.0835	18 18 12.5	5.992
14	13 24 3.24	1.9346	12 17 49.8	9.079	14	15 0 27.53	2.0868	18 24 9.5	5.909
15	13 25 59.40	1.9373	12 26 53.1	9.030	15	15 2 32.83	2.0900	18 30 1.6	5.827
16	13 27 55.72	1.9401	12 35 53.4	8.980	16	15 4 38.33	2.0933	18 35 48.7	5.743
17	13 29 52.21	1.9430	12 44 50.7	8.929	17	15 6 44.03	2.0966	18 41 30.7	5.658
18	13 31 48.88	1.9458	12 53 44.9	8.878	18	15 8 49.92	2.0998	18 47 7.6	5.572
19	13 33 45.71	1.9487	13 2 36.0	8.825	19	15 10 56.01	2.1032	18 52 39.3	5.486
20	13 35 42.72	1.9516	13 11 23.9	8.773	20	15 13 2.30	2.1064	18 58 5.9	5.399
21	13 37 39.90	1.9545	13 20 8.7	8.719	21	15 15 8.78	2.1096	19 3 27.2	5.312
22	13 39 37.26	1.9575	13 28 50.2	8.665	22	15 17 15.45	2.1128	19 8 43.3	5.224
23	13 41 34.80	1.9604	13 37 28.5	8.611	23	15 19 22.32	2.1160	19 13 54.1	5.135
24	13 43 32.51	1.9634	S. 13 46 3.5	8.555	24	15 21 29.37	2.1192	S. 19 18 59.5	5.046

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 25.					SATURDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 21 29.37	2.1192	S.19 18 59.5	5.046	0	17 6 23.83	2.2388	S.21 27 38.9	0.136
1	15 23 36.62	2.1223	19 23 59.6	4.956	1	17 8 38.20	2.2403	21 27 43.7	− 0.024
2	15 25 44.05	2.1255	19 28 54.2	4.865	2	17 10 52.67	2.2419	21 27 41.8	+ 0.088
3	15 27 51.68	2.1287	19 33 43.4	4.774	3	17 13 7.23	2.2433	21 27 33.1	0.201
4	15 29 59.49	2.1318	19 38 27.1	4.683	4	17 15 21.87	2.2447	21 27 17.7	0.313
5	15 32 7.49	2.1349	19 43 5.3	4.590	5	17 17 36.59	2.2461	21 26 55.5	0.426
6	15 34 15.68	2.1380	19 47 37.9	4.497	6	17 19 51.40	2.2474	21 26 26.6	0.538
7	15 36 24.05	2.1410	19 52 4.9	4.403	7	17 22 6.28	2.2487	21 25 50.9	0.652
8	15 38 32.60	2.1440	19 56 26.3	4.309	8	17 24 21.24	2.2499	21 25 8.4	0.765
9	15 40 41.33	2.1471	20 0 42.0	4.214	9	17 26 36.27	2.2510	21 24 19.1	0.879
10	15 42 50.25	2.1501	20 4 52.0	4.119	10	17 28 51.36	2.2521	21 23 22.9	0.993
11	15 44 59.34	2.1530	20 8 56.3	4.023	11	17 31 6.52	2.2533	21 22 20.0	1.106
12	15 47 8.61	2.1559	20 12 54.8	3.927	12	17 33 21.75	2.2543	21 21 10.2	1.220
13	15 49 18.05	2.1588	20 16 47.5	3.829	13	17 35 37.04	2.2553	21 19 53.6	1.333
14	15 51 27.67	2.1618	20 20 34.3	3.732	14	17 37 52.39	2.2563	21 18 30.2	1.447
15	15 53 37.46	2.1646	20 24 15.3	3.633	15	17 40 7.79	2.2571	21 16 59.9	1.562
16	15 55 47.42	2.1674	20 27 50.3	3.534	16	17 42 23.24	2.2580	21 15 22.8	1.676
17	15 57 57.55	2.1703	20 31 19.4	3.435	17	17 44 38.75	2.2588	21 13 38.8	1.790
18	16 0 7.85	2.1730	20 34 42.5	3.335	18	17 46 54.30	2.2596	21 11 48.0	1.903
19	16 2 18.31	2.1757	20 37 59.6	3.235	19	17 49 9.90	2.2603	21 9 50.4	2.018
20	16 4 28.93	2.1784	20 41 10.8	3.134	20	17 51 25.53	2.2609	21 7 45.9	2.133
21	16 6 39.72	2.1811	20 44 15.8	3.033	21	17 53 41.21	2.2617	21 5 34.5	2.247
22	16 8 50.66	2.1837	20 47 14.7	2.931	22	17 55 56.93	2.2622	21 3 16.3	2.361
23	16 11 1.76	2.1863	S.20 50 7.5	2.828	23	17 58 12.67	2.2627	S.21 0 51.2	2.476
	FRIDAY 26.					SUNDAY 28.			
0	16 13 13.02	2.1889	S.20 52 54.1	2.725	0	18 0 28.45	2.2633	S.20 58 19.2	2.590
1	16 15 24.43	2.1914	20 55 34.5	2.622	1	18 2 44.26	2.2637	20 55 40.4	2.704
2	16 17 35.99	2.1939	20 58 8.7	2.518	2	18 5 0.09	2.2641	20 52 54.7	2.818
3	16 19 47.70	2.1964	21 0 36.7	2.414	3	18 7 15.95	2.2645	20 50 2.2	2.932
4	16 21 59.56	2.1988	21 2 58.4	2.309	4	18 9 31.83	2.2648	20 47 2.9	3.046
5	16 24 11.56	2.2013	21 5 13.8	2.204	5	18 11 47.72	2.2650	20 43 56.7	3.160
6	16 26 23.71	2.2036	21 7 22.9	2.098	6	18 14 3.63	2.2653	20 40 43.7	3.273
7	16 28 35.99	2.2059	21 9 25.6	1.992	7	18 16 19.56	2.2656	20 37 23.9	3.387
8	16 30 48.41	2.2081	21 11 21.9	1.886	8	18 18 35.50	2.2658	20 33 57.3	3.501
9	16 33 0.96	2.2103	21 13 11.9	1.779	9	18 20 51.45	2.2659	20 30 23.8	3.615
10	16 35 13.65	2.2126	21 14 55.4	1.672	10	18 23 7.41	2.2660	20 26 43.5	3.728
11	16 37 26.47	2.2147	21 16 32.5	1.565	11	18 25 23.37	2.2660	20 22 56.5	3.841
12	16 39 39.41	2.2168	21 18 3.2	1.457	12	18 27 39.33	2.2660	20 19 2.6	3.954
13	16 41 52.48	2.2189	21 19 27.4	1.348	13	18 29 55.29	2.2660	20 15 2.0	4.067
14	16 44 5.68	2.2209	21 20 45.0	1.239	14	18 32 11.25	2.2660	20 10 54.6	4.180
15	16 46 18.99	2.2229	21 21 56.1	1.130	15	18 34 27.21	2.2659	20 6 40.4	4.293
16	16 48 32.43	2.2249	21 23 0.6	1.021	16	18 36 43.16	2.2658	20 2 19.5	4.404
17	16 50 45.98	2.2268	21 23 58.6	0.912	17	18 38 59.10	2.2656	19 57 51.9	4.516
18	16 52 59.64	2.2286	21 24 50.0	0.802	18	18 41 15.03	2.2654	19 53 17.6	4.628
19	16 55 13.41	2.2304	21 25 34.8	0.691	19	18 43 30.95	2.2653	19 48 36.6	4.739
20	16 57 27.29	2.2322	21 26 12.9	0.580	20	18 45 46.86	2.2650	19 43 48.9	4.851
21	16 59 41.27	2.2339	21 26 44.4	0.469	21	18 48 2.75	2.2647	19 38 54.5	4.962
22	17 1 55.36	2.2356	21 27 9.2	0.358	22	18 50 18.62	2.2643	19 33 53.5	5.072
23	17 4 9.54	2.2373	21 27 27.4	0.248	23	18 52 34.47	2.2640	19 28 45.8	5.183
24	17 6 23.83	2.2388	S.21 27 38.9	0.136	24	18 54 50.30	2.2637	S.19 23 31.5	5.293

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	18 54 50.30	2.2637	S. 19 23 31.5	5.293
1	18 57 6.11	2.2633	19 18 10.6	5.403
2	18 59 21.89	2.2628	19 12 43.2	5.512
3	19 1 37.65	2.2624	19 7 9.2	5.622
4	19 3 53.38	2.2619	19 1 28.6	5.731
5	19 6 9.08	2.2614	18 55 41.5	5.838
6	19 8 24.75	2.2609	18 49 48.0	5.946
7	19 10 40.39	2.2604	18 43 48.0	6.054
8	19 12 56.00	2.2598	18 37 41.5	6.162
9	19 15 11.57	2.2593	18 31 28.6	6.268
10	19 17 27.11	2.2587	18 25 9.3	6.375
11	19 19 42.61	2.2581	18 18 43.6	6.482
12	19 21 58.08	2.2575	18 12 11.5	6.588
13	19 24 13.51	2.2568	18 5 33.1	6.693
14	19 26 28.89	2.2561	17 58 48.4	6.798
15	19 28 44.24	2.2555	17 51 57.4	6.902
16	19 30 59.55	2.2548	17 45 0.2	7.005
17	19 33 14.81	2.2540	17 37 56.8	7.108
18	19 35 30.03	2.2533	17 30 47.2	7.212
19	19 37 45.21	2.2526	17 23 31.4	7.314
20	19 40 0.34	2.2518	17 16 9.5	7.416
21	19 42 15.42	2.2511	17 8 41.5	7.517
22	19 44 30.47	2.2504	17 1 7.5	7.618
23	19 46 45.47	2.2497	S. 16 53 27.4	7.718

TUESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	19 49 0.43	2.2489	S. 16 45 41.3	7.818
1	19 51 15.34	2.2481	16 37 49.2	7.918
2	19 53 30.20	2.2473	16 29 51.2	8.016
3	19 55 45.02	2.2466	16 21 47.3	8.114
4	19 57 59.79	2.2458	16 13 37.4	8.212
5	20 0 14.51	2.2450	16 5 21.8	8.308
6	20 2 29.19	2.2443	15 57 0.4	8.405
7	20 4 43.82	2.2435	15 48 33.2	8.501
8	20 6 58.41	2.2427	15 40 0.3	8.596
9	20 9 12.95	2.2419	15 31 21.7	8.690
10	20 11 27.44	2.2412	15 22 37.5	8.783
11	20 13 41.89	2.2404	15 13 47.7	8.877
12	20 15 56.29	2.2397	15 4 52.3	8.969
13	20 18 10.65	2.2389	14 55 51.4	9.061
14	20 20 24.96	2.2383	14 46 45.0	9.153
15	20 22 39.24	2.2376	14 37 33.1	9.243
16	20 24 53.47	2.2368	14 28 15.8	9.333
17	20 27 7.66	2.2362	14 18 53.2	9.421
18	20 29 21.81	2.2354	14 9 25.3	9.509
19	20 31 35.91	2.2348	13 59 52.1	9.597
20	20 33 49.98	2.2342	13 50 13.6	9.684
21	20 36 4.01	2.2335	13 40 30.0	9.770
22	20 38 18.00	2.2328	13 30 41.2	9.856
23	20 40 31.95	2.2322	13 20 47.3	9.940
24	20 42 45.86	2.2316	S. 13 10 48.4	10.024

WEDNESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	20 42 45.86	2.2316	S. 13 10 48.4	10.024
1	20 44 59.74	2.2311	13 0 44.4	10.107
2	20 47 13.59	2.2306	12 50 35.5	10.189
3	20 49 27.41	2.2301	12 40 21.7	10.271
4	20 51 41.20	2.2295	12 30 3.0	10.352
5	20 53 54.95	2.2290	12 19 39.5	10.432
6	20 56 8.68	2.2286	12 9 11.2	10.511
7	20 58 22.38	2.2282	11 58 38.2	10.589
8	21 0 36.06	2.2278	11 48 0.5	10.667
9	21 2 49.72	2.2274	11 37 18.2	10.743
10	21 5 3.35	2.2270	11 26 31.3	10.818
11	21 7 16.96	2.2267	11 15 40.0	10.893
12	21 9 30.55	2.2263	11 4 44.2	10.967
13	21 11 44.12	2.2261	10 53 44.0	11.040
14	21 13 57.68	2.2259	10 42 39.4	11.113
15	21 16 11.23	2.2257	10 31 30.4	11.183
16	21 18 24.76	2.2255	10 20 17.3	11.253
17	21 20 38.29	2.2254	10 9 0.0	11.323
18	21 22 51.81	2.2253	9 57 38.6	11.391
19	21 25 5.32	2.2252	9 46 13.1	11.459
20	21 27 18.83	2.2252	9 34 43.5	11.526
21	21 29 32.34	2.2252	9 23 10.0	11.591
22	21 31 45.85	2.2252	9 11 32.6	11.656
23	21 33 59.36	2.2253	S. 8 59 51.3	11.719

THURSDAY, NOVEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	21 36 12.88	2.2253	S. 8 48 6.3	11.782

PHASES OF THE MOON.

			d	h	m
☽	First Quarter . . .	Oct.	1	9	10.7
○	Full Moon		8	1	18.2
☾	Last Quarter		14	21	50.9
●	New Moon		23	1	27.3
☽	First Quarter		30	20	17.5

			d	h
☾	Perigee	Oct.	7	17.7
☾	Apogee		20	18.6

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Sun	W.	85 24 32	3085	86 54 14	3007	88 24 18	2990	89 54 43	2973
	Jupiter	W.	26 34 34	2724	28 10 42	2709	29 47 10	2693	31 24 0	2676
	α Pegasi	E.	78 39 2	2818	77 4 58	2804	75 30 35	2790	73 55 54	2777
2	Sun	W.	97 32 24	2881	99 5 7	2862	100 38 14	2845	102 11 44	2825
	Jupiter	W.	39 33 45	2591	41 12 52	2574	42 52 23	2556	44 32 18	2538
	Saturn	W.	17 26 7	2568	19 5 46	2548	20 45 52	2528	22 26 26	2510
	α Pegasi	E.	65 58 7	2710	64 21 41	2698	62 44 59	2687	61 8 1	2675
	α Arietis	E.	108 54 37	2580	107 15 14	2562	105 35 27	2544	103 55 15	2526
3	Sun	W.	110 5 28	2730	111 41 28	2710	113 17 54	2692	114 54 44	2673
	Jupiter	W.	52 58 7	2448	54 40 33	2431	56 23 24	2412	58 6 41	2394
	Saturn	W.	30 55 48	2417	32 38 59	2398	34 22 36	2380	36 6 40	2362
	α Pegasi	E.	52 59 36	2628	51 21 19	2621	49 42 53	2616	48 4 20	2613
	α Arietis	E.	95 27 54	2435	93 45 9	2416	92 1 57	2398	90 18 20	2381
4	Sun	W.	123 5 17	2581	124 44 38	2564	126 24 23	2545	128 4 33	2529
	Jupiter	W.	66 49 31	2306	68 35 22	2289	70 21 37	2272	72 8 17	2256
	Antares	W.	66 14 5	2274	68 0 42	2257	69 47 45	2240	71 35 14	2223
	Saturn	W.	44 53 29	2273	46 40 8	2256	48 27 12	2239	50 14 42	2223
	α Arietis	E.	81 33 58	2295	79 47 51	2278	78 1 19	2262	76 14 23	2246
	Aldebaran	E.	114 41 9	2274	112 54 32	2258	111 7 30	2240	109 20 2	2223
5	Jupiter	W.	81 7 39	2178	82 56 40	2163	84 46 3	2149	86 35 47	2136
	Antares	W.	80 38 42	2145	82 28 33	2130	84 18 46	2116	86 9 21	2103
	Saturn	W.	59 18 13	2145	61 8 4	2130	62 58 17	2116	64 48 51	2103
	α Arietis	E.	67 14 3	2173	65 24 55	2161	63 35 28	2149	61 45 43	2137
	Aldebaran	E.	100 16 35	2145	98 26 44	2130	96 36 30	2116	94 45 55	2102
6	Jupiter	W.	95 49 17	2077	97 40 51	2067	99 32 41	2058	101 24 45	2050
	Saturn	W.	74 6 31	2045	75 58 55	2035	77 51 35	2026	79 44 29	2017
	α Arietis	E.	52 32 56	2091	50 41 43	2085	48 50 20	2079	46 58 49	2075
	Aldebaran	E.	85 28 10	2044	83 35 45	2035	81 43 5	2026	79 50 11	2016
7	Saturn	W.	89 11 57	1986	91 5 53	1982	92 59 56	1979	94 54 4	1976
	α Aquilæ	W.	60 14 26	2544	61 54 38	2519	63 35 25	2497	65 16 42	2478
	Aldebaran	E.	70 22 47	1987	68 28 53	1984	66 34 54	1982	64 40 51	1980
	Pollux	E.	112 21 43	2054	110 29 33	2048	108 37 14	2043	106 44 47	2039
8	Saturn	W.	104 25 15	1977	106 19 25	1979	108 13 32	1983	110 7 33	1987
	α Aquilæ	W.	73 48 35	2420	75 31 41	2415	77 14 54	2411	78 58 14	2409
	Fomalhaut	W.	47 43 1	2891	49 15 31	2842	50 49 5	2798	52 23 35	2760
	Aldebaran	E.	55 10 15	1984	53 16 15	1987	51 22 21	1992	49 28 34	1998
	Pollux	E.	97 21 28	2034	95 28 47	2036	93 36 9	2039	91 43 35	2043
	Mars	E.	112 41 57	2149	110 52 13	2152	109 2 33	2154	107 12 56	2158
9	Fomalhaut	W.	60 26 32	2639	62 4 34	2626	63 42 54	2615	65 21 27	2607
	Aldebaran	E.	40 2 26	2042	38 9 57	2054	36 17 47	2067	34 25 57	2082
	Pollux	E.	82 22 47	2077	80 31 12	2086	78 39 52	2096	76 48 47	2107
	Mars	E.	98 6 44	2190	96 18 1	2198	94 29 31	2208	92 41 15	2218
	Regulus	E.	119 11 14	2028	117 18 23	2035	115 25 44	2044	113 33 18	2053
	Venus	E.	121 47 16	2350	120 2 30	2359	118 17 57	2369	116 33 38	2380

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	SUN	W.	91 25 30	2954	92 56 40	2937	94 28 12	2920	96 0 6	2901
	JUPITER	W.	33 1 12	2660	34 38 46	2643	36 16 43	2626	37 55 2	2607
	α Pegasi	E.	72 20 56	2763	70 45 40	2750	69 10 6	2737	67 34 15	2724
2	SUN	W.	103 45 39	2806	105 19 59	2787	106 54 43	2768	108 29 53	2749
	JUPITER	W.	46 12 38	2520	47 53 23	2503	49 34 32	2485	51 16 7	2467
	SATURN	W.	24 7 26	2491	25 48 52	2472	27 30 44	2453	29 13 3	2435
	α Pegasi	E.	59 30 48	2664	57 53 20	2654	56 15 38	2644	54 37 43	2635
	α Arietis	E.	102 14 38	2507	100 33 35	2489	98 52 7	2471	97 10 13	2453
3	SUN	W.	116 32 0	2655	118 9 41	2635	119 47 48	2617	121 26 20	2599
	JUPITER	W.	59 50 24	2377	61 34 32	2359	63 19 6	2341	65 4 6	2324
	SATURN	W.	37 51 10	2344	39 36 6	2326	41 21 28	2308	43 7 16	2291
	α Pegasi	E.	46 25 43	2612	44 47 4	2612	43 8 26	2615	41 29 52	2622
	α Arietis	E.	88 34 18	2364	86 49 51	2346	85 4 58	2328	83 19 40	2312
4	SUN	W.	129 45 6	2512	131 26 2	2496	133 7 21	2481	134 49 2	2466
	JUPITER	W.	73 55 22	2239	75 42 51	2223	77 30 44	2208	79 19 0	2192
	Antares	W.	73 23 7	2206	75 11 25	2190	77 0 7	2174	78 49 13	2159
	SATURN	W.	52 2 36	2206	53 50 54	2190	55 39 37	2174	57 28 44	2159
	α Arietis	E.	74 27 4	2230	72 39 21	2215	70 51 16	2201	69 2 50	2187
	Aldebaran	E.	107 32 9	2206	105 43 51	2190	103 55 9	2175	102 6 4	2160
5	JUPITER	W.	88 25 51	2123	90 16 15	2111	92 6 58	2099	93 57 59	2088
	Antares	W.	88 0 16	2090	89 51 31	2078	91 43 4	2066	93 34 56	2055
	SATURN	W.	66 39 45	2090	68 30 59	2078	70 22 32	2066	72 14 23	2055
	α Arietis	E.	59 55 41	2126	58 5 22	2116	56 14 47	2107	54 23 58	2098
	Aldebaran	E.	92 54 59	2090	91 3 44	2077	89 12 10	2066	87 20 18	2055
6	JUPITER	W.	103 17 1	2042	105 9 30	2035	107 2 10	2028	108 55 0	2023
	SATURN	W.	81 37 37	2009	83 30 57	2003	85 24 27	1996	87 18 8	1991
	α Arietis	E.	45 7 12	2073	43 15 31	2072	41 23 48	2072	39 32 5	2075
	Aldebaran	E.	77 57 2	2009	76 3 42	2003	74 10 12	1997	72 16 33	1993
7	SATURN	W.	96 48 16	1975	98 42 30	1974	100 36 46	1974	102 31 2	1975
	α Aquilæ	W.	66 58 26	2462	68 40 32	2450	70 22 56	2437	72 5 38	2426
	Aldebaran	E.	62 46 44	1978	60 52 35	1979	58 58 27	1979	57 4 20	1981
	Pollux	E.	104 52 13	2036	102 59 35	2034	101 6 54	2033	99 14 11	2034
8	SATURN	W.	112 1 28	1992	113 55 16	1997	115 48 55	2004	117 42 23	2012
	α Aquilæ	W.	80 41 36	2410	82 24 57	2412	84 8 16	2415	85 51 30	2419
	Fomalhaut	W.	53 58 56	2727	55 35 0	2700	57 11 40	2676	58 48 52	2655
	Aldebaran	E.	47 34 57	2005	45 41 30	2012	43 48 14	2021	41 55 12	2031
	Pollux	E.	89 51 7	2048	87 58 47	2053	86 6 36	2060	84 14 36	2068
	MARS	E.	105 23 25	2163	103 34 1	2169	101 44 46	2174	99 55 40	2181
9	Fomalhaut	W.	67 0 12	2603	68 39 3	2600	70 17 58	2599	71 56 54	2600
	Aldebaran	E.	32 34 31	2099	30 43 31	2118	28 52 59	2138	27 2 57	2159
	Pollux	E.	74 57 59	2120	73 7 30	2134	71 17 22	2147	69 27 34	2161
	MARS	E.	90 53 15	2230	89 5 32	2242	87 18 7	2254	85 31 0	2267
	Regulus	E.	111 41 6	2063	109 49 10	2075	107 57 32	2086	106 6 11	2098
	VENUS	E.	114 49 34	2391	113 5 47	2403	111 22 17	2416	109 39 5	2430

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III^{h.}	P. L. of Diff.	VI^{h.}	P. L. of Diff.	IX^{h.}	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	Fomalhaut	W.	73 35 49	2604	75 14 39	2610	76 53 21	2616	78 31 54	2624
	Pollux	E.	67 38 8	2177	65 49 6	2194	64 0 29	2211	62 12 18	2229
	Mars	E.	83 44 12	2281	81 57 45	2296	80 11 40	2311	78 25 56	2327
	Regulus	E.	104 15 8	2111	102 24 25	2124	100 34 3	2138	98 44 2	2153
	Venus	E.	107 56 13	2444	106 13 41	2459	104 31 30	2474	102 49 40	2490
11	Fomalhaut	W.	86 41 10	2688	88 18 6	2704	89 54 41	2721	91 30 53	2740
	a Arietis	W.	24 21 35	2430	26 4 27	2426	27 47 25	2424	29 30 26	2424
	Pollux	E.	53 18 27	2332	51 33 14	2356	49 48 36	2380	48 4 33	2405
	Mars	E.	69 43 17	2413	68 0 1	2432	66 17 12	2451	64 34 50	2470
	Regulus	E.	89 39 46	2234	87 52 9	2251	86 4 57	2268	84 18 11	2286
	Venus	E.	94 26 26	2579	92 47 2	2598	91 8 4	2617	89 29 32	2636
12	*a* Arietis	W.	38 4 28	2457	39 46 42	2469	41 28 39	2482	43 10 17	2495
	Pollux	E.	39 33 54	2553	37 53 55	2588	36 14 44	2625	34 36 23	2665
	Mars	E.	56 9 56	2572	54 30 23	2594	52 51 20	2615	51 12 45	2637
	Regulus	E.	75 31 3	2380	73 47 0	2400	72 3 25	2419	70 20 17	2438
	Venus	E.	81 23 38	2740	79 47 51	2762	78 12 33	2781	76 37 40	2801
	Sun	E.	125 45 5	2692	124 8 14	2710	122 31 48	2730	120 55 48	2750
13	*a* Arietis	W.	51 33 31	2572	53 13 4	2588	54 52 16	2604	56 31 6	2620
	Mars	E.	43 7 18	2749	41 31 43	2772	39 56 38	2795	38 22 4	2820
	Regulus	E.	61 51 34	2537	60 11 12	2557	58 31 18	2576	56 51 50	2596
	Venus	E.	68 50 12	2909	67 18 5	2931	65 46 26	2952	64 15 13	2973
	Sun	E.	113 2 29	2852	111 29 8	2872	109 56 13	2891	108 23 43	2911
14	Aldebaran	W.	31 27 29	2713	33 3 52	2725	34 39 59	2737	36 15 50	2750
	Mars	E.	30 37 12	2946	29 5 52	2976	27 35 9	3007	26 5 5	3040
	Regulus	E.	48 41 12	2694	47 4 24	2713	45 28 1	2738	43 52 4	2751
	Venus	E.	56 45 42	3077	55 17 4	3098	53 48 52	3117	52 21 3	3138
	Sun	E.	100 47 24	3007	99 17 20	3026	97 47 40	3044	96 18 22	3062
15	Aldebaran	W.	44 10 37	2818	45 44 42	2831	47 18 30	2844	48 52 1	2856
	Regulus	E.	35 58 38	2848	34 25 13	2869	32 52 14	2889	31 19 41	2910
	Venus	E.	45 7 57	3234	43 42 28	3254	42 17 23	3272	40 52 39	3290
	Sun	E.	88 57 14	3147	87 30 1	3163	86 3 8	3179	84 36 34	3194
16	Aldebaran	W.	56 35 42	2916	58 7 41	2926	59 39 27	2937	61 10 59	2947
	Venus	E.	33 54 21	3382	32 31 44	3402	31 9 30	3422	29 47 38	3443
	Sun	E.	77 28 4	3264	76 3 10	3277	74 38 32	3290	73 14 9	3301
17	Aldebaran	W.	68 45 33	2993	70 15 54	3001	71 46 5	3009	73 16 6	3017
	Pollux	W.	28 8 6	3315	29 32 0	3293	30 56 20	3276	32 20 59	3261
	Sun	E.	66 15 27	3355	64 52 19	3364	63 29 21	3373	62 6 34	3381
18	Aldebaran	W.	80 44 2	3048	82 13 15	3054	83 42 21	3059	85 11 21	3064
	Pollux	W.	39 27 49	3216	40 53 39	3210	42 19 36	3206	43 45 38	3203
	Mars	W.	18 21 34	3481	19 42 19	3460	21 3 29	3441	22 24 59	3423
	Sun	E.	55 14 53	3419	53 52 58	3425	52 31 10	3430	51 9 27	3435
19	Pollux	W.	50 56 47	3188	52 23 10	3187	53 49 35	3184	55 16 3	3182
	Mars	W.	29 16 26	3374	30 39 12	3368	32 2 5	3363	33 25 4	3359

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	Fomalhaut	W.	80 10 16	2635	81 48 24	2646	83 26 17	2658	85 3 53	2672
	Pollux	E.	60 24 33	2248	58 37 17	2268	56 50 30	2288	55 4 13	2309
	MARS	E.	76 40 36	2343	74 55 39	2360	73 11 7	2377	71 26 59	2395
	Regulus	E.	96 54 24	2169	95 5 9	2184	93 16 17	2200	91 27 49	2216
	VENUS	E.	101 8 13	2507	99 27 10	2525	97 46 31	2542	96 6 16	2560
11	Fomalhaut	W.	93 6 40	2760	94 42 1	2781	96 16 54	2802	97 51 17	2825
	α Arietis	W.	31 13 27	2425	32 56 26	2430	34 39 18	2437	36 21 59	2446
	Pollux	E.	46 21 5	2432	44 38 16	2460	42 56 7	2489	41 14 39	2520
	MARS	E.	62 52 55	2490	61 11 28	2510	59 30 29	2530	57 49 58	2551
	Regulus	E.	82 31 51	2304	80 45 58	2324	79 0 33	2342	77 15 35	2360
	VENUS	E.	87 51 26	2657	86 13 48	2677	84 36 37	2698	82 59 54	2718
12	α Arietis	W.	44 51 37	2510	46 32 37	2524	48 13 17	2540	49 53 35	2556
	Pollux	E.	32 58 56	2709	31 22 28	2757	29 47 4	2807	28 12 45	2866
	MARS	E.	49 34 40	2659	47 57 5	2681	46 19 59	2703	44 43 23	2726
	Regulus	E.	68 37 37	2458	66 55 25	2478	65 13 41	2497	63 32 24	2517
	VENUS	E.	75 3 13	2824	73 29 16	2846	71 55 48	2866	70 22 46	2887
	SUN	E.	119 20 16	2771	117 45 10	2791	116 10 30	2811	114 36 16	2831
13	α Arietis	W.	58 9 34	2637	59 47 39	2653	61 25 22	2669	63 2 43	2686
	MARS	E.	36 48 2	2844	35 14 31	2869	33 41 32	2894	32 9 5	2920
	Regulus	E.	55 12 49	2615	53 34 15	2635	51 56 8	2655	50 18 27	2674
	VENUS	E.	62 44 26	2994	61 14 6	3016	59 44 13	3036	58 14 45	3056
	SUN	E.	106 51 38	2931	105 19 58	2950	103 48 42	2969	102 17 51	2989
14	Aldebaran	W.	37 51 23	2763	39 26 37	2777	41 1 34	2791	42 36 14	2804
	MARS	E.	24 35 42	3076	23 7 3	3114	21 39 10	3154	20 12 6	3197
	Regulus	E.	42 16 32	2771	40 41 26	2790	39 6 45	2809	37 32 29	2828
	VENUS	E.	50 53 39	3158	49 26 39	3177	48 0 2	3196	46 33 48	3215
	SUN	E.	94 49 26	3079	93 20 51	3097	91 52 38	3114	90 24 46	3131
15	Aldebaran	W.	50 25 16	2868	51 58 16	2880	53 31 0	2892	55 3 28	2904
	Regulus	E.	29 47 35	2933	28 15 58	2957	26 44 51	2980	25 14 13	3005
	VENUS	E.	39 28 16	3309	38 4 15	3328	36 40 36	3346	35 17 18	3365
	SUN	E.	83 10 18	3209	81 44 19	3224	80 18 38	3237	78 53 13	3251
16	Aldebaran	W.	62 42 18	2958	64 13 24	2967	65 44 18	2976	67 15 1	2985
	VENUS	E.	28 26 10	3462	27 5 2	3483	25 44 20	3508	24 24 5	3532
	SUN	E.	71 49 59	3313	70 26 3	3324	69 2 19	3334	67 38 47	3345
17	Aldebaran	W.	74 45 58	3023	76 15 42	3031	77 45 16	3038	79 14 42	3043
	Pollux	W.	33 45 56	3248	35 11 8	3238	36 36 32	3230	38 2 6	3222
	SUN	E.	60 43 56	3390	59 21 28	3397	57 59 8	3404	56 36 56	3412
18	Aldebaran	W.	86 40 15	3068	88 9 4	3072	89 37 48	3076	91 6 27	3080
	Pollux	W.	45 11 44	3198	46 37 55	3196	48 4 9	3193	49 30 27	3191
	MARS	W.	23 46 49	3408	25 8 56	3396	26 31 17	3388	27 53 47	3380
	SUN	E.	49 47 50	3441	48 26 20	3446	47 4 56	3450	45 43 36	3453
19	Pollux	W.	56 42 34	3180	58 9 7	3179	59 35 41	3177	61 2 18	3174
	MARS	W.	34 48 7	3356	36 11 14	3352	37 34 25	3348	38 57 41	3345

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
19	Sun	E.	44 22 19	3456	43 1 6	3461	41 39 58	3464	40 18 54	3467
20	Pollux	W.	62 28 58	3173	63 55 40	3171	65 22 24	3168	66 49 11	3167
	Mars	W.	40 21 0	3343	41 44 22	3340	43 7 47	3337	44 31 16	3334
	Sun	E.	33 34 17	3479	32 13 29	3480	30 52 42	3481	29 31 57	3483
21	Mars	W.	51 29 30	3319	52 53 19	3316	54 17 11	3313	55 41 8	3309
	Sun	E.	22 48 41	3492	21 28 8	3495	20 7 38	3500	18 47 14	3505
25	Sun	W.	21 22 50	3349	22 46 5	3342	24 9 29	3335	25 33 0	3325
	a Aquilæ	E.	70 50 13	3430	69 28 30	3433	68 6 51	3437	66 45 16	3442
	Fomalhaut	E.	98 32 25	3433	97 10 46	3424	95 48 57	3415	94 26 57	3407
	a Pegasi	E.	117 37 32	3124	116 9 52	3114	114 42 0	3104	113 13 55	3093
26	Sun	W.	32 33 35	3276	33 58 15	3266	35 23 7	3256	36 48 9	3247
	a Aquilæ	E.	59 59 11	3484	58 38 29	3496	57 18 0	3509	55 57 46	3525
	Fomalhaut	E.	87 34 44	3371	86 11 54	3365	84 48 58	3360	83 25 56	3355
	a Pegasi	E.	105 50 22	3043	104 21 3	3034	102 51 33	3025	101 21 51	3015
27	Sun	W.	43 56 12	3198	45 22 24	3188	46 48 48	3178	48 15 24	3168
	a Aquilæ	E.	49 21 47	3641	48 3 56	3673	46 46 40	3709	45 30 2	3748
	Fomalhaut	E.	76 29 34	3339	75 6 8	3338	73 42 41	3337	72 19 12	3338
	a Pegasi	E.	93 50 25	2969	92 19 33	2959	90 48 29	2950	89 17 14	2941
28	Sun	W.	55 31 37	3112	56 59 32	3100	58 27 42	3088	59 56 6	3076
	Antares	W.	22 49 41	2862	24 22 48	2838	25 56 27	2818	27 30 31	2798
	Jupiter	W.	18 31 1	2821	20 5 1	2811	21 39 15	2800	23 13 43	2788
	a Aquilæ	E.	39 19 25	4049	38 8 34	4135	36 59 6	4233	35 51 11	4347
	Fomalhaut	E.	65 22 13	3351	63 59 1	3358	62 35 56	3365	61 12 59	3374
	a Pegasi	E.	81 38 4	2895	80 5 39	2886	78 33 2	2877	77 0 14	2868
29	Sun	W.	67 21 53	3013	68 51 50	3000	70 22 3	2986	71 52 33	2972
	Antares	W.	35 27 0	2711	37 3 25	2696	38 40 10	2681	40 17 16	2665
	Jupiter	W.	31 9 48	2730	32 45 48	2718	34 22 4	2705	35 58 37	2692
	Fomalhaut	E.	54 21 33	3448	53 0 11	3471	51 39 15	3496	50 18 47	3526
	a Pegasi	E.	69 13 20	2825	67 39 24	2816	66 5 17	2808	64 31 0	2800
	a Arietis	E.	112 16 56	2707	110 40 25	2694	109 3 37	2680	107 26 30	2666
30	Sun	W.	79 29 28	2901	81 1 45	2886	82 34 22	2871	84 7 17	2856
	Antares	W.	48 27 55	2590	50 7 4	2574	51 46 34	2559	53 26 25	2544
	Jupiter	W.	44 5 44	2626	45 44 4	2612	47 22 42	2599	49 1 39	2584
	Saturn	W.	25 17 35	2599	26 56 32	2583	28 35 50	2568	30 15 29	2553
	Fomalhaut	E.	43 46 16	3750	42 30 22	3818	41 15 38	3891	40 2 9	3975
	a Pegasi	E.	56 37 8	2766	55 1 56	2762	53 26 38	2758	51 51 15	2755
	a Arietis	E.	99 16 25	2599	97 37 28	2585	95 58 13	2571	94 18 38	2557
31	Sun	W.	91 56 50	2779	93 31 45	2763	95 7 1	2748	96 42 37	2732
	Antares	W.	61 50 54	2469	63 32 51	2454	65 15 9	2438	66 57 49	2423
	Jupiter	W.	57 21 19	2512	59 2 15	2497	60 43 32	2482	62 25 10	2468
	Saturn	W.	38 38 49	2479	40 20 32	2464	42 2 36	2448	43 45 2	2434
	a Arietis	E.	85 55 51	2486	84 14 18	2472	82 32 25	2458	80 50 12	2443
	Aldebaran	E.	119 6 30	2467	117 24 31	2452	115 42 10	2437	113 59 28	2422

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
19	SUN	E.	38 57 53	3470	37 36 55	3472	36 16 0	3474	34 55 7	3477
20	Pollux	W.	68 16 0	3165	69 42 51	3163	71 9 45	3160	72 36 43	3158
	MARS	W.	45 54 49	3332	47 18 24	3329	48 42 2	3325	50 5 44	3322
	SUN	E.	28 11 14	3485	26 50 33	3486	25 29 53	3488	24 9 16	3490
21	MARS	W.	57 5 9	3306	58 29 13	3304	59 53 20	3300	61 17 32	3294
	SUN	E.	17 26 55	3511	16 6 43	3520	14 46 41	3532	13 26 53	3545
25	SUN	W.	26 56 42	3313	28 20 39	3303	29 44 48	3294	31 9 6	3285
	a Aquilæ	E.	65 23 47	3448	64 2 25	3454	62 41 11	3462	61 20 6	3472
	Fomalhaut	E.	93 4 47	3399	91 42 29	3391	90 20 2	3384	88 57 27	3377
	a Pegasi	E.	111 45 37	3083	110 17 7	3073	108 48 24	3063	107 19 29	3053
26	SUN	W.	38 13 23	3236	39 38 49	3227	41 4 25	3218	42 30 13	3209
	a Aquilæ	E.	54 37 50	3544	53 18 14	3563	51 58 59	3586	50 40 9	3611
	Fomalhaut	E.	82 2 48	3351	80 39 36	3347	79 16 19	3344	77 52 58	3341
	a Pegasi	E.	99 51 57	3006	98 21 52	2997	96 51 35	2987	95 21 6	2977
27	SUN	W.	49 42 12	3157	51 9 13	3145	52 36 28	3134	54 3 56	3124
	a Aquilæ	E.	44 14 6	3795	42 58 59	3847	41 44 45	3906	40 31 31	3973
	Fomalhaut	E.	70 55 44	3338	69 32 17	3341	68 8 53	3343	66 45 31	3346
	a Pegasi	E.	87 45 47	2932	86 14 8	2924	84 42 19	2914	83 10 18	2904
28	SUN	W.	61 24 45	3064	62 53 39	3052	64 22 48	3039	65 52 13	3026
	Antares	W.	29 5 1	2779	30 39 56	2761	32 15 15	2744	33 50 56	2727
	JUPITER	W.	24 48 26	2777	26 23 24	2766	27 58 36	2754	29 34 4	2742
	a Aquilæ	E.	34 45 2	4475	33 40 48	4625	32 38 45	4797	31 39 6	4989
	Fomalhaut	E.	59 50 13	3385	58 27 39	3398	57 5 20	3412	55 43 17	3429
	a Pegasi	E.	75 27 14	2859	73 54 2	2851	72 20 40	2842	70 47 6	2832
29	SUN	W.	73 23 21	2958	74 54 26	2944	76 25 49	2930	77 57 29	2916
	Antares	W.	41 54 43	2650	43 32 30	2635	45 10 38	2620	46 49 6	2604
	JUPITER	W.	37 35 28	2679	39 12 36	2667	40 50 0	2654	42 27 42	2640
	Fomalhaut	E.	48 58 52	3561	47 39 35	3598	46 20 59	3643	45 3 11	3693
	a Pegasi	E.	62 56 32	2792	61 21 54	2785	59 47 7	2779	58 12 12	2772
	a Arietis	E.	105 49 5	2654	104 11 23	2640	102 33 23	2626	100 55 3	2612
30	SUN	W.	85 40 32	2841	87 14 7	2826	88 48 1	2810	90 22 16	2795
	Antares	W.	55 6 37	2530	56 47 9	2514	58 28 3	2499	60 9 18	2484
	JUPITER	W.	50 40 56	2570	52 20 32	2556	54 0 27	2541	55 40 43	2527
	SATURN	W.	31 55 28	2539	33 35 47	2524	35 16 27	2509	36 57 27	2494
	Fomalhaut	E.	38 50 5	4073	37 39 37	4186	36 30 58	4320	35 24 24	4468
	a Pegasi	E.	50 15 48	2752	48 40 17	2750	47 4 44	2752	45 29 13	2756
	a Arietis	E.	92 38 44	2543	90 58 31	2529	89 17 58	2515	87 37 4	2501
31	SUN	W.	98 18 34	2716	99 54 53	2701	101 31 32	2685	103 8 32	2669
	Antares	W.	68 40 51	2408	70 24 14	2394	72 7 58	2378	73 52 4	2363
	JUPITER	W.	64 7 8	2453	65 49 27	2439	67 32 6	2424	69 15 7	2408
	SATURN	W.	45 27 48	2420	47 10 54	2405	48 54 21	2390	50 38 9	2375
	a Arietis	E.	79 7 39	2429	77 24 45	2415	75 41 31	2401	73 57 58	2387
	Aldebaran	E.	112 16 24	2407	110 32 59	2391	108 49 12	2377	107 5 4	2362

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	14 24 54.66	9.790	S. 14 22 45.4	−48.21	16 8.45	66.83	16 18.74	0.067
Frid.	2	14 28 49.99	9.823	14 41 55.4	47.62	16 8.70	66.94	16 19.96	0.034
Sat.	3	14 32 46.12	9.856	15 0 51.2	47.02	16 8.94	67.05	16 20.39	0.001
SUN.	4	14 36 43.03	9.889	15 19 32.2	−46.40	16 9.18	67.17	16 20.03	0.032
Mon.	5	14 40 40.77	9.923	15 37 58.1	45.76	16 9.42	67.29	16 18.86	0.065
Tues.	6	14 44 39.32	9.958	15 56 8.4	45.10	16 9.66	67.41	16 16.87	0.100
Wed.	7	14 48 38.70	9.993	16 14 2.9	−44.43	16 9.90	67.53	16 14.05	0.135
Thur.	8	14 52 38.92	10.028	16 31 41.0	43.74	16 10.13	67.65	16 10.39	0.170
Frid.	9	14 56 40.00	10.063	16 49 2.6	43.04	16 10.36	67.77	16 5.88	0.206
Sat.	10	15 0 41.94	10.099	17 6 6.9	−42.32	16 10.59	67.89	16 0.51	0.242
SUN.	11	15 4 44.75	10.135	17 22 53.8	41.58	16 10.82	68.01	15 54.27	0.278
Mon.	12	15 8 48.42	10.171	17 39 22.9	40.83	16 11.04	68.13	15 47.17	0.314
Tues.	13	15 12 52.97	10.207	17 55 33.7	−40.06	16 11.26	68.25	15 39.20	0.351
Wed.	14	15 16 58.39	10.243	18 11 25.8	39.27	16 11.48	68.37	15 30.36	0.387
Thur.	15	15 21 4.68	10.279	18 26 58.8	38.47	16 11.69	68.49	15 20.66	0.423
Frid.	16	15 25 11.83	10.315	18 42 12.3	−37 65	16 11.90	68.60	15 10.09	0.459
Sat.	17	15 29 19.84	10.351	18 57 5.9	36.81	16 12.11	68.72	14 58.67	0.494
SUN.	18	15 33 28.71	10.386	19 11 39.2	35.96	16 12.31	68.83	14 46.39	0.529
Mon.	19	15 37 38.42	10.421	19 25 52.0	−35.09	16 12.51	68.95	14 33.27	0.564
Tues.	20	15 41 48.97	10.455	19 39 43.6	34.20	16 12.71	69.06	14 19.32	0.598
Wed.	21	15 46 0.33	10.489	19 53 13.8	33.30	16 12.91	69.17	14 4.54	0.632
Thur.	22	15 50 12.52	10.522	20 6 22.3	−32.38	16 13.10	69.28	13 48.97	0.666
Frid.	23	15 54 25.49	10.555	20 19 8.7	31.45	16 13.29	69.39	13 32.58	0.699
Sat.	24	15 58 39.25	10.587	20 31 32.4	30.51	16 13.47	69.50	13 15.43	0.731
SUN.	25	16 2 53.77	10.619	20 43 33.4	−29.55	16 13.65	69.61	12 57.51	0.762
Mon.	26	16 7 9.04	10.649	20 55 11.1	28.58	16 13.82	69.71	12 38.85	0.792
Tues.	27	16 11 25.04	10.678	21 6 25.3	27.59	16 13.99	69.81	12 19.47	0.822
Wed.	28	16 15 41.74	10.707	21 17 15.5	−26.59	16 14.16	69.91	11 59.38	0.851
Thur.	29	16 19 59.14	10.736	21 27 41.7	25.57	16 14.32	70.01	11 38.60	0.880
Frid.	30	16 24 17.20	10.764	21 37 43.4	24.55	16 14.48	70.10	11 17.16	0.907
Sat.	31	16 28 35.90	10.790	S. 21 47 20.2	−23.52	16 14.63	70.19	10 55.07	0.933

Note.—The mean time of semidiameter passing may be found by subtracting $0^{s}.19$ from the sidereal time.

The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	14 24 57.33	9.790	S. 14 22 58.5	−48.20	16 18.76	0.067	14 41 16.09
Frid.	2	14 28 52.67	9.823	14 42 8.4	47.61	16 19.97	0.034	14 45 12.64
Sat.	3	14 32 48.80	9.856	15 1 4.0	47.01	16 20.40	0.001	14 49 9.20
SUN.	4	14 36 45.72	9.889	15 19 44.8	−46.39	16 20.03	0.032	14 53 5.75
Mon.	5	14 40 43.46	9.923	15 38 10.5	45.75	16 18.85	0.065	14 57 2.31
Tues.	6	14 44 42.01	9.958	15 56 20.6	45.09	16 16.85	0.100	15 0 58.86
Wed.	7	14 48 41.40	9.993	16 14 14.9	−44.42	16 14.02	0.135	15 4 55.42
Thur.	8	14 52 41.62	10.028	16 31 52.8	43.73	16 10.35	0.170	15 8 51.97
Frid.	9	14 56 42.70	10.063	16 49 14.1	43.03	16 5.83	0.206	15 12 48.53
Sat.	10	15 0 44.63	10.099	17 6 18.2	−42.31	16 0.45	0.242	15 16 45.08
SUN.	11	15 4 47.43	10.135	17 23 4.8	41.57	15 54.21	0.278	15 20 41.64
Mon.	12	15 8 51.09	10.171	17 39 33.6	40.82	15 47.10	0.314	15 24 38.19
Tues.	13	15 12 55.63	10.207	17 55 44.1	−40.05	15 39.12	0.351	15 28 34.75
Wed.	14	15 17 1.03	10.243	18 11 35.9	39.26	15 30.27	0.387	15 32 31.30
Thur.	15	15 21 7.30	10.279	18 27 8.6	38.46	15 20.56	0.423	15 36 27.86
Frid.	16	15 25 14.43	10.315	18 42 21.8	−37.64	15 9.98	0.459	15 40 24.42
Sat.	17	15 29 22.42	10.351	18 57 15.1	36.80	14 58.55	0.494	15 44 20.97
SUN.	18	15 33 31.26	10.386	19 11 48.1	35.95	14 46.27	0.529	15 48 17.53
Mon.	19	15 37 40.94	10.421	19 26 0.5	−35.08	14 33.14	0.564	15 52 14.08
Tues.	20	15 41 51.46	10.455	19 39 51.8	34.19	14 19.18	0.598	15 56 10.64
Wed.	21	15 46 2.79	10.489	19 53 21.8	33.29	14 4.40	0.632	16 0 7.20
Thur.	22	15 50 14.94	10.522	20 6 29.8	−32.37	13 48.82	0.666	16 4 3.75
Frid.	23	15 54 27.87	10.555	20 19 15.8	31.44	13 32.43	0.699	16 8 0.31
Sat.	24	15 58 41.59	10.587	20 31 39.2	30.50	13 15.27	0.731	16 11 56.86
SUN.	25	16 2 56.07	10.619	20 43 39.8	−29.54	12 57.35	0.762	16 15 53.42
Mon.	26	16 7 11.29	10.649	20 55 17.2	28.57	12 38.69	0.792	16 19 49.98
Tues.	27	16 11 27.24	10.678	21 6 31.0	27.58	12 19.30	0.822	16 23 46.53
Wed.	28	16 15 43.88	10.707	21 17 20.9	−26.58	11 59.21	0.851	16 27 43.09
Thur.	29	16 20 1.22	10.736	21 27 46.7	25.56	11 38.43	0.880	16 31 39.65
Frid.	30	16 24 19.22	10.764	21 37 48.0	24.54	11 16.99	0.907	16 35 36.20
Sat.	31	16 28 37.86	10.790	S. 21 47 24.5	−23.51	10 54.90	0.933	16 39 32.76

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	305	218 37 40.2	36 44.2	150.19	+ 0.39	9.9965272	−48.0	9 17 12.38
2	306	219 37 45.6	36 49.4	150.25	0.39	9.9964127	47.5	9 13 16.47
3	307	220 37 52.4	36 56.1	150.31	0.34	9.9962995	46.9	9 9 20.56
4	308	221 38 0.9	37 4.4	150.38	+ 0.27	9.9961879	−46.2	9 5 24.65
5	309	222 38 11.0	37 14.4	150.45	0.17	9.9960779	45.5	9 1 28.74
6	310	223 38 22.7	37 26.0	150.52	+ 0.04	9.9959697	44.7	8 57 32.83
7	311	224 38 36.2	37 39.4	150.59	− 0.09	9.9958634	−43.9	8 53 36.92
8	312	225 38 51.6	37 54.6	150.67	0.24	9.9957589	43.1	8 49 41.01
9	313	226 39 8.7	38 11.6	150.75	0.38	9.9956563	42.4	8 45 45.11
10	314	227 39 27.8	38 30.5	150.83	− 0.50	9.9955556	−41.7	8 41 49.20
11	315	228 39 48.8	38 51.4	150.92	0.61	9.9954564	41.0	8 37 53.29
12	316	229 40 11.7	39 14.2	151.00	0.70	9.9953590	40.3	8 33 57.38
13	317	230 40 36.6	39 38.9	151.08	− 0.76	9.9952631	−39.7	8 30 1.47
14	318	231 41 3.4	40 5.5	151.16	0.79	9.9951687	39.1	8 26 5.56
15	319	232 41 32.0	40 34.0	151.24	0.80	9.9950757	38.5	8 22 9.65
16	320	233 42 2.5	41 4.4	151.31	− 0.78	9.9949840	−38.0	8 18 13.74
17	321	234 42 34.8	41 36.6	151.38	0.72	9.9948935	37.5	8 14 17.83
18	322	235 43 8.9	42 10.5	151.45	0.66	9.9948042	37.0	8 10 21.92
19	323	236 43 44.6	42 46.1	151.52	− 0.55	9.9947161	−36.5	8 6 26.01
20	324	237 44 22.0	43 23.3	151.59	0.43	9.9946291	36.0	8 2 30.10
21	325	238 45 0.9	44 2.1	151.65	0.32	9.9945432	35.6	7 58 34.19
22	326	239 45 41.4	44 42.4	151.71	− 0.19	9.9944584	−35.2	7 54 38.28
23	327	240 46 23.2	45 24.0	151.77	− 0.05	9.9943747	34.7	7 50 42.37
24	328	241 47 6.3	46 7.0	151.82	+ 0.07	9.9942921	34.2	7 46 46.46
25	329	242 47 50.7	46 51.2	151.87	+ 0.19	9.9942107	−33.6	7 42 50.55
26	330	243 48 36.2	47 36.6	151.92	0.28	9.9941307	33.0	7 38 54.64
27	331	244 49 22.8	48 23.1	151.96	0.34	9.9940518	32.4	7 34 58.72
28	332	245 50 10.4	49 10.5	152.00	+ 0.38	9.9939746	−31.8	7 31 2.81
29	333	246 50 59.0	49 58.9	152.04	0.40	9.9938990	31.0	7 27 6.90
30	334	247 51 48.4	50 48.1	152.08	0.37	9.9938251	30.2	7 23 10.99
31	335	248 52 38.7	51 38.3	152.12	+ 0.29	9.9937534	−29.4	7 19 15.08

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^d.0$.

Diff. for 1 Hour,
$-9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 6.0	16 12.1	58 58.6	+1.90	59 21.1	+1.83	7 9.7	2.14	8.9
2	16 18.0	16 23.4	59 42.6	1.73	60 2.5	1.56	8 1.2	2.16	9.9
3	16 28.2	16 32.3	60 20.3	1.36	60 35.2	1.11	8 53.8	2.22	10.9
4	16 35.5	16 37.6	60 46.9	+0.81	60 54.8	+0.48	9 48.1	2.31	11.9
5	16 38.6	16 38.4	60 58.5	+0.13	60 57.7	−0.25	10 44.6	2.41	12.9
6	16 37.0	16 34.3	60 52.5	−0.62	60 42.7	0.99	11 43.5	2.49	13.9
7	16 30.5	16 25.7	60 28.8	−1.32	60 11.0	−1.62	12 43.8	2.53	14.9
8	16 19.9	16 13.4	59 49.8	1.87	59 26.0	2.08	13 44.2	2.49	15.9
9	16 6.4	15 58.9	59 0.0	2.23	58 32.5	2.32	14 42.8	2.38	16.9
10	15 51.2	15 43.5	58 4.4	−2.35	57 36.1	−2.34	15 38.2	2.23	17.9
11	15 35.9	15 28.6	57 8.3	2.28	56 41.5	2.18	16 29.9	2.08	18.9
12	15 21.7	15 15.2	56 16.0	2.05	55 52.3	1.89	17 18.0	1.94	19.9
13	15 9.3	15 4.1	55 30.6	−1.71	55 11.2	−1.52	18 3.0	1.83	20.9
14	14 59.4	14 55.5	54 54.1	1.32	54 39.6	1.11	18 45.9	1.75	21.9
15	14 52.2	14 49.6	54 27.5	0.90	54 18.0	0.69	19 27.6	1.72	22.9
16	14 47.7	14 46.4	54 11.0	−0.48	54 6.4	−0.29	20 8.8	1.73	23.9
17	14 45.8	14 45.8	54 4.1	−0.10	54 4.0	+0.08	20 50.7	1.76	24.9
18	14 46.3	14 47.3	54 6.0	+0.24	54 9.8	0.39	21 33.7	1.83	25.9
19	14 48.8	14 50.8	54 15.3	+0.52	54 22.4	+0.65	22 18.7	1.92	26.9
20	14 53.1	14 55.7	54 30.8	0.75	54 40.5	0.84	23 5.9	2.01	27.9
21	14 58.6	15 1.7	54 51.1	0.92	55 2.6	0.99	23 55.3	2.10	28.9
22	15 5.1	15 8.6	55 14.9	+1.05	55 27.7	+1.09	☌		0.2
23	15 12.2	15 15.9	55 41.0	1.13	55 54.8	1.16	0 46.7	2.17	1.2
24	15 19.8	15 23.7	56 9.0	1.19	56 23.4	1.22	1 39.1	2.20	2.2
25	15 27.7	15 31.8	56 38.1	+1.24	56 53.1	+1.26	2 31.8	2.19	3.2
26	15 36.0	15 40.2	57 8.4	1.28	57 23.8	1.30	3 24.0	2.15	4.2
27	15 44.4	15 48.7	57 39.5	1.31	57 55.3	1.32	4 15.2	2.11	5.2
28	15 53.1	15 57.4	58 11.2	+1.32	58 27.0	+1.31	5 5.6	2.08	6.2
29	16 1.6	16 5.8	58 42.6	1.28	58 57.8	1.23	5 55.5	2.08	7.2
30	16 9.7	16 13.4	59 12.4	1.17	59 25.9	1.07	6 45.7	2.11	8.2
31	16 16.8	16 19.6	59 38.2	+0.95	59 48.8	+0.80	7 37.1	2.18	9.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 1.					SATURDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 36 12.88	2.2253	S. 8 48 6.3	11.782	0	23 23 58.71	2.2830	N. 1 28 18.2	13.423
1	21 38 26.40	2.2255	8 36 17.5	11.843	1	23 26 15.76	2.2853	1 41 43.6	13.424
2	21 40 39.94	2.2257	8 24 25.1	11.903	2	23 28 32.95	2.2878	1 55 9.1	13.424
3	21 42 53.48	2.2258	8 12 29.1	11.963	3	23 30 50.29	2.2903	2 8 34.5	13.423
4	21 45 7.04	2.2262	8 0 29.5	12.022	4	23 33 7.78	2.2928	2 21 59.8	13.420
5	21 47 20.62	2.2265	7 48 26.5	12.079	5	23 35 25.43	2.2954	2 35 24.9	13.416
6	21 49 34.22	2.2268	7 36 20.0	12.136	6	23 37 43.23	2.2979	2 48 49.7	13.409
7	21 51 47.84	2.2272	7 24 10.2	12.192	7	23 40 1.18	2.3006	3 2 14.0	13.401
8	21 54 1.48	2.2276	7 11 57.0	12.247	8	23 42 19.30	2.3033	3 15 37.8	13.392
9	21 56 15.15	2.2281	6 59 40.6	12.299	9	23 44 37.58	2.3061	3 29 1.1	13.382
10	21 58 28.85	2.2286	6 47 21.1	12.351	10	23 46 56.03	2.3088	3 42 23.6	13.369
11	22 0 42.58	2.2291	6 34 58.5	12.403	11	23 49 14.64	2.3117	3 55 45.4	13.356
12	22 2 56.34	2.2297	6 22 32.8	12.453	12	23 51 33.43	2.3146	4 9 6.3	13.340
13	22 5 10.14	2.2303	6 10 4.2	12.501	13	23 53 52.39	2.3175	4 22 26.2	13.323
14	22 7 23.98	2.2311	5 57 32.7	12.549	14	23 56 11.53	2.3204	4 35 45.0	13.304
15	22 9 37.87	2.2318	5 44 58.3	12.596	15	23 58 30.84	2.3234	4 49 2.7	13.284
16	22 11 51.80	2.2326	5 32 21.2	12.641	16	0 0 50.34	2.3265	5 2 19.1	13.262
17	22 14 5.78	2.2334	5 19 41.4	12.685	17	0 3 10.02	2.3296	5 15 34.1	13.238
18	22 16 19.81	2.2343	5 6 59.0	12.728	18	0 5 29.89	2.3327	5 28 47.6	13.213
19	22 18 33.90	2.2353	4 54 14.0	12.770	19	0 7 49.94	2.3358	5 41 59.6	13.187
20	22 20 48.04	2.2362	4 41 26.6	12.811	20	0 10 10.19	2.3391	5 55 10.0	13.158
21	22 23 2.24	2.2372	4 28 36.7	12.851	21	0 12 30.63	2.3423	6 8 18.6	13.128
22	22 25 16.50	2.2383	4 15 44.5	12.888	22	0 14 51.26	2.3455	6 21 25.3	13.096
23	22 27 30.83	2.2393	S. 4 2 50.1	12.926	23	0 17 12.09	2.3488	N. 6 34 30.1	13.063
	FRIDAY 2.					SUNDAY 4.			
0	22 29 45.22	2.2405	S. 3 49 53.4	12.962	0	0 19 33.12	2.3522	N. 6 47 32.8	13.028
1	22 31 59.69	2.2417	3 36 54.7	12.996	1	0 21 54.35	2.3555	7 0 33.4	12.991
2	22 34 14.23	2.2429	3 23 53.9	13.029	2	0 24 15.78	2.3589	7 13 31.7	12.953
3	22 36 28.84	2.2442	3 10 51.2	13.061	3	0 26 37.42	2.3623	7 26 27.7	12.913
4	22 38 43.53	2.2456	2 57 46.6	13.092	4	0 28 59.26	2.3658	7 39 21.2	12.870
5	22 40 58.31	2.2471	2 44 40.2	13.121	5	0 31 21.31	2.3693	7 52 12.1	12.827
6	22 43 13.18	2.2485	2 31 32.1	13.149	6	0 33 43.57	2.3728	8 5 0.4	12.782
7	22 45 28.13	2.2499	2 18 22.3	13.176	7	0 36 6.04	2.3763	8 17 45.9	12.735
8	22 47 43.17	2.2515	2 5 11.0	13.202	8	0 38 28.72	2.3798	8 30 28.6	12.687
9	22 49 58.31	2.2531	1 51 58.1	13.227	9	0 40 51.62	2.3834	8 43 8.3	12.636
10	22 52 13.54	2.2548	1 38 43.7	13.249	10	0 43 14.73	2.3870	8 55 44.9	12.584
11	22 54 28.88	2.2565	1 25 28.1	13.271	11	0 45 38.06	2.3907	9 8 18.4	12.531
12	22 56 44.32	2.2583	1 12 11.2	13.291	12	0 48 1.61	2.3943	9 20 48.6	12.475
13	22 58 59.87	2.2600	0 58 53.2	13.309	13	0 50 25.37	2.3979	9 33 15.4	12.418
14	23 1 15.52	2.2618	0 45 34.1	13.327	14	0 52 49.36	2.4016	9 45 38.8	12.360
15	23 3 31.29	2.2638	0 32 14.0	13.343	15	0 55 13.56	2.4053	9 57 58.6	12.299
16	23 5 47.17	2.2657	0 18 52.9	13.358	16	0 57 37.99	2.4090	10 10 14.7	12.237
17	23 8 3.17	2.2677	S. 0 5 31.1	13.371	17	1 0 2.64	2.4127	10 22 27.0	12.173
18	23 10 19.29	2.2697	N. 0 7 51.6	13.383	18	1 2 27.51	2.4163	10 34 35.4	12.108
19	23 12 35.53	2.2718	0 21 14.9	13.393	19	1 4 52.60	2.4200	10 46 39.9	12.041
20	23 14 51.90	2.2739	0 34 38.7	13.402	20	1 7 17.91	2.4238	10 58 40.3	11.971
21	23 17 8.40	2.2761	0 48 3.1	13.409	21	1 9 43.45	2.4276	11 10 36.5	11.900
22	23 19 25.03	2.2783	1 1 27.8	13.415	22	1 12 9.22	2.4313	11 22 28.4	11.828
23	23 21 41.80	2.2807	1 14 52.9	13.420	23	1 14 35.21	2.4350	11 34 15.9	11.754
24	23 23 58.71	2.2830	N. 1 28 18.2	13.423	24	1 17 1.42	2.4388	N. 11 45 58.9	11.678

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 5.					WEDNESDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 17 1.42	2.4388	N.11 45 58.9	11.678	0	3 17 55.23	2.5795	N.19 10 4.2	6.308
1	1 19 27.86	2.4425	11 57 37.3	11.601	1	3 20 30.04	2.5808	19 16 18.5	6.168
2	1 21 54.52	2.4463	12 9 11.0	11.523	2	3 23 4.93	2.5820	19 22 24.4	6.028
3	1 24 21.41	2.4500	12 20 40.0	11.442	3	3 25 39.88	2.5831	19 28 21.8	5.886
4	1 26 48.52	2.4537	12 32 4.0	11.359	4	3 28 14.90	2.5841	19 34 10.7	5.744
5	1 29 15.85	2.4573	12 43 23.1	11.276	5	3 30 49.97	2.5850	19 39 51.1	5.601
6	1 31 43.40	2.4611	12 54 37.1	11.190	6	3 33 25.10	2.5858	19 45 22.8	5.457
7	1 34 11.18	2.4648	13 5 45.9	11.103	7	3 36 0.27	2.5865	19 50 45.9	5.313
8	1 36 39.17	2.4684	13 16 49.4	11.013	8	3 38 35.48	2.5871	19 56 0.3	5.168
9	1 39 7.39	2.4721	13 27 47.5	10.923	9	3 41 10.72	2.5877	20 1 6.0	5.023
10	1 41 35.82	2.4758	13 38 40.2	10.832	10	3 43 46.00	2.5881	20 6 3.0	4.877
11	1 44 4.48	2.4794	13 49 27.3	10.738	11	3 46 21.29	2.5883	20 10 51.2	4.730
12	1 46 33.35	2.4829	14 0 8.7	10.643	12	3 48 56.59	2.5884	20 15 30.6	4.583
13	1 49 2.43	2.4865	14 10 44.4	10.546	13	3 51 31.90	2.5885	20 20 1.2	4.437
14	1 51 31.73	2.4901	14 21 14.2	10.447	14	3 54 7.21	2.5885	20 24 23.0	4.289
15	1 54 1.24	2.4936	14 31 38.0	10.347	15	3 56 42.52	2.5883	20 28 35.9	4.141
16	1 56 30.96	2.4970	14 41 55.8	10.246	16	3 59 17.81	2.5880	20 32 39.9	3.993
17	1 59 0.88	2.5004	14 52 7.5	10.143	17	4 1 53.08	2.5877	20 36 35.1	3.845
18	2 1 31.01	2.5039	15 2 13.0	10.039	18	4 4 28.33	2.5873	20 40 21.4	3.696
19	2 4 1.35	2.5073	15 12 12.2	9.933	19	4 7 3.55	2.5866	20 43 58.7	3.548
20	2 6 31.88	2.5105	15 22 5.0	9.826	20	4 9 38.72	2.5858	20 47 27.1	3.399
21	2 9 2.61	2.5138	15 31 51.3	9.717	21	4 12 13.85	2.5851	20 50 46.6	3.250
22	2 11 33.54	2.5172	15 41 31.0	9.607	22	4 14 48.93	2.5842	20 53 57.1	3.101
23	2 14 4.67	2.5203	N.15 51 4.1	9.495	23	4 17 23.95	2.5831	N.20 56 58.7	2.952
	TUESDAY 6.					THURSDAY 8.			
0	2 16 35.98	2.5234	N.16 0 30.4	9.382	0	4 19 58.90	2.5819	N.20 59 51.3	2.803
1	2 19 7.48	2.5265	16 9 49.9	9.268	1	4 22 33.78	2.5807	21 2 35.0	2.653
2	2 21 39.16	2.5296	16 19 2.5	9.152	2	4 25 8.58	2.5793	21 5 9.7	2.503
3	2 24 11.03	2.5327	16 28 8.1	9.035	3	4 27 43.29	2.5777	21 7 35.4	2.354
4	2 26 43.08	2.5356	16 37 6.7	8.917	4	4 30 17.90	2.5760	21 9 52.2	2.206
5	2 29 15.30	2.5384	16 45 58.1	8.797	5	4 32 52.41	2.5743	21 12 0.1	2.058
6	2 31 47.69	2.5413	16 54 42.3	8.676	6	4 35 26.82	2.5726	21 13 59.1	1.909
7	2 34 20.25	2.5440	17 3 19.2	8.553	7	4 38 1.12	2.5706	21 15 49.2	1.761
8	2 36 52.97	2.5467	17 11 48.7	8.430	8	4 40 35.29	2.5684	21 17 30.4	1.613
9	2 39 25.85	2.5493	17 20 10.8	8.306	9	4 43 9.33	2.5663	21 19 2.7	1.464
10	2 41 58.89	2.5519	17 28 25.4	8.180	10	4 45 43.24	2.5640	21 20 26.1	1.316
11	2 44 32.08	2.5544	17 36 32.5	8.053	11	4 48 17.01	2.5616	21 21 40.6	1.168
12	2 47 5.42	2.5568	17 44 31.8	7.924	12	4 50 50.63	2.5591	21 22 46.3	1.022
13	2 49 38.90	2.5592	17 52 23.4	7.796	13	4 53 24.10	2.5565	21 23 43.2	0.875
14	2 52 12.52	2.5614	18 0 7.3	7.666	14	4 55 57.41	2.5538	21 24 31.3	0.729
15	2 54 46.27	2.5636	18 7 43.3	7.533	15	4 58 30.55	2.5509	21 25 10.7	0.583
16	2 57 20.15	2.5657	18 15 11.3	7.401	16	5 1 3.52	2.5480	21 25 41.3	0.438
17	2 59 54.15	2.5677	18 22 31.4	7.268	17	5 3 36.31	2.5450	21 26 3.2	0.293
18	3 2 28.27	2.5697	18 29 43.5	7.134	18	5 6 8.92	2.5418	21 26 16.4	0.148
19	3 5 2.51	2.5716	18 36 47.5	6.998	19	5 8 41.33	2.5386	21 26 21.0	+ 0.004
20	3 7 36.86	2.5733	18 43 43.3	6.863	20	5 11 13.55	2.5353	21 26 16.9	− 0.139
21	3 10 11.31	2.5750	18 50 31.0	6.726	21	5 13 45.56	2.5318	21 26 4.3	0.282
22	3 12 45.86	2.5766	18 57 10.4	6.588	22	5 16 17.37	2.5283	21 25 43.1	0.424
23	3 15 20.50	2.5781	19 3 41.5	6.448	23	5 18 48.96	2.5247	21 25 13.4	0.565
24	3 17 55.23	2.5795	N.19 10 4.2	6.308	24	5 21 20.33	2.5209	N.21 24 35.3	0.706

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 9.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	5 21 20.33	2.5209	N.21 24 35.3	0.706
1	5 23 51.47	2.5171	21 23 48.7	0.847
2	5 26 22.38	2.5133	21 22 53.7	0.986
3	5 28 53.06	2.5093	21 21 50.4	1.125
4	5 31 23.49	2.5052	21 20 38.7	1.263
5	5 33 53.68	2.5010	21 19 18.8	1.400
6	5 36 23.61	2.4967	21 17 50.7	1.537
7	5 38 53.28	2.4923	21 16 14.4	1.673
8	5 41 22.69	2.4880	21 14 30.0	1.807
9	5 43 51.84	2.4835	21 12 37.6	1.941
10	5 46 20.71	2.4789	21 10 37.1	2.074
11	5 48 49.31	2.4743	21 8 28.7	2.206
12	5 51 17.62	2.4695	21 6 12.4	2.338
13	5 53 45.65	2.4648	21 3 48.2	2.468
14	5 56 13.39	2.4599	21 1 16.2	2.598
15	5 58 40.84	2.4550	20 58 36.5	2.726
16	6 1 7.99	2.4500	20 55 49.1	2.853
17	6 3 34.84	2.4449	20 52 54.1	2.980
18	6 6 1.38	2.4398	20 49 51.5	3.106
19	6 8 27.61	2.4346	20 46 41.4	3.231
20	6 10 53.53	2.4293	20 43 23.8	3.355
21	6 13 19.13	2.4241	20 39 58.8	3.478
22	6 15 44.42	2.4188	20 36 26.5	3.599
23	6 18 9.39	2.4134	N.20 32 46.9	3.719

SATURDAY 10.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	6 20 34.03	2.4079	N.20 29 0.2	3.838
1	6 22 58.34	2.4024	20 25 6.3	3.957
2	6 25 22.32	2.3969	20 21 5.3	4.075
3	6 27 45.97	2.3914	20 16 57.3	4.191
4	6 30 9.29	2.3858	20 12 42.4	4.306
5	6 32 32.26	2.3801	20 8 20.6	4.420
6	6 34 54.90	2.3744	20 3 52.0	4.533
7	6 37 17.19	2.3687	19 59 16.6	4.645
8	6 39 39.14	2.3630	19 54 34.6	4.756
9	6 42 0.75	2.3572	19 49 45.9	4.866
10	6 44 22.00	2.3513	19 44 50.7	4.974
11	6 46 42.91	2.3455	19 39 49.0	5.082
12	6 49 3.46	2.3396	19 34 40.9	5.188
13	6 51 23.66	2.3338	19 29 26.4	5.293
14	6 53 43.51	2.3279	19 24 5.7	5.397
15	6 56 3.01	2.3220	19 18 38.8	5.500
16	6 58 22.15	2.3160	19 13 5.7	5.602
17	7 0 40.93	2.3101	19 7 26.6	5.703
18	7 2 59.36	2.3042	19 1 41.4	5.802
19	7 5 17.43	2.2982	18 55 50.3	5.900
20	7 7 35.14	2.2923	18 49 53.4	5.997
21	7 9 52.50	2.2863	18 43 50.7	6.093
22	7 12 9.49	2.2803	18 37 42.2	6.189
23	7 14 26.12	2.2742	18 31 28.0	6.283
24	7 16 42.39	2.2682	N.18 25 8.3	6.375

SUNDAY 11.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	7 16 42.39	2.2682	N.18 25 8.3	6.375
1	7 18 58.30	2.2623	18 18 43.0	6.467
2	7 21 13.86	2.2563	18 12 12.3	6.557
3	7 23 29.05	2.2503	18 5 36.2	6.646
4	7 25 43.89	2.2443	17 58 54.8	6.734
5	7 27 58.37	2.2383	17 52 8.1	6.821
6	7 30 12.49	2.2324	17 45 16.3	6.906
7	7 32 26.26	2.2265	17 38 19.4	6.991
8	7 34 39.67	2.2205	17 31 17.4	7.075
9	7 36 52.72	2.2146	17 24 10.4	7.158
10	7 39 5.42	2.2088	17 16 58.5	7.239
11	7 41 17.77	2.2028	17 9 41.7	7.319
12	7 43 29.76	2.1969	17 2 20.2	7.398
13	7 45 41.40	2.1911	16 54 54.0	7.476
14	7 47 52.69	2.1853	16 47 23.1	7.553
15	7 50 3.63	2.1794	16 39 47.7	7.628
16	7 52 14.22	2.1737	16 32 7.7	7.704
17	7 54 24.47	2.1679	16 24 23.2	7.778
18	7 56 34.37	2.1622	16 16 34.3	7.849
19	7 58 43.93	2.1565	16 8 41.2	7.921
20	8 0 53.15	2.1508	16 0 43.8	7.992
21	8 3 2.03	2.1452	15 52 42.2	8.062
22	8 5 10.57	2.1395	15 44 36.4	8.130
23	8 7 18.77	2.1339	N.15 36 26.6	8.197

MONDAY 12.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	8 9 26.64	2.1284	N.15 28 12.8	8.263
1	8 11 34.18	2.1229	15 19 55.1	8.328
2	8 13 41.39	2.1174	15 11 33.4	8.393
3	8 15 48.27	2.1120	15 3 7.9	8.456
4	8 17 54.83	2.1066	14 54 38.7	8.518
5	8 20 1.06	2.1012	14 46 5.8	8.579
6	8 22 6.97	2.0958	14 37 29.2	8.640
7	8 24 12.56	2.0906	14 28 49.0	8.699
8	8 26 17.84	2.0853	14 20 5.3	8.758
9	8 28 22.80	2.0802	14 11 18.1	8.815
10	8 30 27.46	2.0750	14 2 27.5	8.871
11	8 32 31.80	2.0698	13 53 33.6	8.926
12	8 34 35.84	2.0648	13 44 36.4	8.980
13	8 36 39.58	2.0598	13 35 36.0	9.034
14	8 38 43.01	2.0548	13 26 32.3	9.087
15	8 40 46.15	2.0498	13 17 25.6	9.138
16	8 42 48.99	2.0450	13 8 15.8	9.188
17	8 44 51.55	2.0402	12 59 3.0	9.238
18	8 46 53.81	2.0353	12 49 47.2	9.288
19	8 48 55.79	2.0306	12 40 28.5	9.335
20	8 50 57.48	2.0258	12 31 7.0	9.383
21	8 52 58.89	2.0212	12 21 42.6	9.429
22	8 55 0.03	2.0167	12 12 15.5	9.474
23	8 57 0.89	2.0121	12 2 45.7	9.518
24	8 59 1.48	2.0076	N.11 53 13.3	9.562

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	TUESDAY 13.					THURSDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 59 1.48	2.0076	N. 11 53 13.3	9.562	0	10 31 17.13	1.8590	N. 3 38 53.4	10.763
1	9 1 1.80	2.0032	11 43 38.3	9.604	1	10 33 8.62	1.8574	3 28 7.4	10.772
2	9 3 1.86	1.9988	11 34 0.8	9.646	2	10 35 0.02	1.8558	3 17 20.8	10.780
3	9 5 1.66	1.9945	11 24 20.8	9.688	3	10 36 51.32	1.8543	3 6 33.8	10.787
4	9 7 1.20	1.9902	11 14 38.3	9.728	4	10 38 42.53	1.8528	2 55 46.4	10.793
5	9 9 0.48	1.9859	11 4 53.5	9.767	5	10 40 33.66	1.8514	2 44 58.6	10.800
6	9 10 59.51	1.9818	10 55 6.3	9.806	6	10 42 24.70	1.8501	2 34 10.4	10.806
7	9 12 58.30	1.9778	10 45 16.8	9.843	7	10 44 15.67	1.8488	2 23 21.9	10.811
8	9 14 56.84	1.9737	10 35 25.1	9.880	8	10 46 6.56	1.8476	2 12 33.1	10.815
9	9 16 55.14	1.9697	10 25 31.1	9.916	9	10 47 57.38	1.8464	2 1 44.1	10.819
10	9 18 53.20	1.9657	10 15 35.1	9.952	10	10 49 48.13	1.8453	1 50 54.8	10.823
11	9 20 51.02	1.9618	10 5 36.9	9.986	11	10 51 38.81	1.8442	1 40 5.3	10.825
12	9 22 48.61	1.9579	9 55 36.8	10.019	12	10 53 29.43	1.8432	1 29 15.7	10.828
13	9 24 45.97	1.9542	9 45 34.6	10.053	13	10 55 19.99	1.8423	1 18 26.0	10.829
14	9 26 43.11	1.9505	9 35 30.5	10.085	14	10 57 10.50	1.8414	1 7 36.2	10.830
15	9 28 40.03	1.9468	9 25 24.4	10.117	15	10 59 0.96	1.8406	0 56 46.4	10.830
16	9 30 36.73	1.9433	9 15 16.5	10.147	16	11 0 51.37	1.8398	0 45 56.6	10.830
17	9 32 33.22	1.9397	9 5 6.8	10.177	17	11 2 41.74	1.8392	0 35 6.8	10.829
18	9 34 29.49	1.9362	8 54 55.3	10.207	18	11 4 32.07	1.8385	0 24 17.1	10.828
19	9 36 25.56	1.9327	8 44 42.0	10.235	19	11 6 22.36	1.8378	0 13 27.4	10.827
20	9 38 21.42	1.9293	8 34 27.1	10.263	20	11 8 12.61	1.8373	N. 0 2 37.9	10.823
21	9 40 17.08	1.9261	8 24 10.5	10.290	21	11 10 2.84	1.8369	S. 0 8 11.4	10.820
22	9 42 12.55	1.9228	8 13 52.3	10.316	22	11 11 53.04	1.8364	0 19 0.5	10.817
23	9 44 7.82	1.9196	N. 8 3 32.6	10.341	23	11 13 43.21	1.8361	S. 0 29 49.4	10.813
	WEDNESDAY 14.					FRIDAY 16.			
0	9 46 2.90	1.9165	N. 7 53 11.4	10.366	0	11 15 33.37	1.8358	S. 0 40 38.1	10.808
1	9 47 57.80	1.9134	7 42 48.7	10.391	1	11 17 23.51	1.8355	0 51 26.4	10.803
2	9 49 52.51	1.9103	7 32 24.5	10.414	2	11 19 13.63	1.8353	1 2 14.4	10.797
3	9 51 47.04	1.9074	7 21 59.0	10.437	3	11 21 3.75	1.8353	1 13 2.0	10.790
4	9 53 41.40	1.9046	7 11 32.1	10.458	4	11 22 53.86	1.8352	1 23 49.2	10.783
5	9 55 35.59	1.9018	7 1 4.0	10.479	5	11 24 43.97	1.8352	1 34 35.9	10.775
6	9 57 29.61	1.8989	6 50 34.6	10.501	6	11 26 34.08	1.8352	1 45 22.2	10.767
7	9 59 23.46	1.8962	6 40 3.9	10.522	7	11 28 24.19	1.8353	1 56 8.0	10.758
8	10 1 17.15	1.8935	6 29 32.0	10.541	8	11 30 14.31	1.8354	2 6 53.2	10.749
9	10 3 10.68	1.8909	6 18 59.0	10.559	9	11 32 4.44	1.8356	2 17 37.9	10.739
10	10 5 4.06	1.8883	6 8 24.9	10.577	10	11 33 54.58	1.8358	2 28 21.9	10.728
11	10 6 57.28	1.8858	5 57 49.7	10.594	11	11 35 44.74	1.8362	2 39 5.3	10.718
12	10 8 50.36	1.8835	5 47 13.6	10.611	12	11 37 34.93	1.8367	2 49 48.1	10.707
13	10 10 43.30	1.8811	5 36 36.4	10.627	13	11 39 25.14	1.8370	3 0 30.1	10.694
14	10 12 36.09	1.8788	5 25 58.3	10.643	14	11 41 15.37	1.8374	3 11 11.4	10.682
15	10 14 28.75	1.8766	5 15 19.3	10.658	15	11 43 5.63	1.8380	3 21 51.9	10.668
16	10 16 21.28	1.8743	5 4 39.4	10.672	16	11 44 55.93	1.8386	3 32 31.6	10.654
17	10 18 13.67	1.8722	4 53 58.7	10.685	17	11 46 46.26	1.8392	3 43 10.4	10.639
18	10 20 5.94	1.8702	4 43 17.2	10.698	18	11 48 36.63	1.8399	3 53 48.3	10.624
19	10 21 58.09	1.8682	4 32 34.9	10.711	19	11 50 27.05	1.8407	4 4 25.3	10.608
20	10 23 50.12	1.8663	4 21 51.9	10.723	20	11 52 17.51	1.8414	4 15 1.3	10.593
21	10 25 42.04	1.8643	4 11 8.2	10.734	21	11 54 8.02	1.8423	4 25 36.4	10.576
22	10 27 33.84	1.8625	4 0 23.8	10.744	22	11 55 58.59	1.8433	4 36 10.4	10.558
23	10 29 25.54	1.8608	3 49 38.9	10.753	23	11 57 49.21	1.8442	4 46 43.3	10.540
24	10 31 17.13	1.8590	N. 3 38 53.4	10.763	24	11 59 39.89	1.8452	S. 4 57 15.2	10.522

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 17.					MONDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 59 39.89	1.8452	S. 4 57 15.2	10.522	0	13 30 18.31	1.9480	S. 12 49 7.1	8.890
1	12 1 30.63	1.8463	5 7 45.9	10.503	1	13 32 15.28	1.9511	12 57 59.0	8.839
2	12 3 21.44	1.8473	5 18 15.5	10.483	2	13 34 12.44	1.9543	13 6 47.8	8.788
3	12 5 12.31	1.8485	5 28 43.9	10.463	3	13 36 9.79	1.9574	13 15 33.5	8.736
4	12 7 3.26	1.8498	5 39 11.0	10.441	4	13 38 7.33	1.9606	13 24 16.1	8.683
5	12 8 54.28	1.8510	5 49 36.8	10.419	5	13 40 5.06	1.9638	13 32 55.5	8.630
6	12 10 45.38	1.8523	6 0 1.3	10.398	6	13 42 2.99	1.9671	13 41 31.7	8.576
7	12 12 36.56	1.8537	6 10 24.5	10.375	7	13 44 1.11	1.9703	13 50 4.6	8.520
8	12 14 27.82	1.8551	6 20 46.3	10.352	8	13 45 59.43	1.9736	13 58 34.1	8.464
9	12 16 19.17	1.8566	6 31 6.7	10.328	9	13 47 57.94	1.9769	14 7 0.3	8.408
10	12 18 10.61	1.8581	6 41 25.6	10.303	10	13 49 56.66	1.9803	14 15 23.1	8.352
11	12 20 2.14	1.8597	6 51 43.0	10.277	11	13 51 55.58	1.9836	14 23 42.5	8.293
12	12 21 53.77	1.8612	7 1 58.8	10.251	12	13 53 54.69	1.9869	14 31 58.3	8.234
13	12 23 45.49	1.8628	7 12 13.1	10.225	13	13 55 54.01	1.9904	14 40 10.6	8.176
14	12 25 37.31	1.8646	7 22 25.8	10.198	14	13 57 53.54	1.9939	14 48 19.4	8.116
15	12 27 29.24	1.8664	7 32 36.8	10.170	15	13 59 53.28	1.9974	14 56 24.5	8.055
16	12 29 21.28	1.8682	7 42 46.2	10.142	16	14 1 53.23	2.0008	15 4 26.0	7.994
17	12 31 13.42	1.8700	7 52 53.9	10.113	17	14 3 53.38	2.0043	15 12 23.8	7.932
18	12 33 5.68	1.8719	8 2 59.8	10.083	18	14 5 53.74	2.0078	15 20 17.8	7.868
19	12 34 58.05	1.8738	8 13 3.9	10.053	19	14 7 54.32	2.0114	15 28 8.0	7.804
20	12 36 50.54	1.8758	8 23 6.1	10.022	20	14 9 55.11	2.0149	15 35 54.3	7.739
21	12 38 43.15	1.8778	8 33 6.5	9.991	21	14 11 56.11	2.0184	15 43 36.7	7.674
22	12 40 35.88	1.8799	8 43 5.0	9.959	22	14 13 57.32	2.0220	15 51 15.2	7.608
23	12 42 28.74	1.8820	S. 8 53 1.6	9.927	23	14 15 58.75	2.0256	S. 15 58 49.7	7.541
	SUNDAY 18.					TUESDAY 20.			
0	12 44 21.72	1.8842	S. 9 2 56.2	9.893	0	14 18 0.39	2.0292	S. 16 6 20.1	7.473
1	12 46 14.84	1.8864	9 12 48.7	9.858	1	14 20 2.25	2.0328	16 13 46.5	7.406
2	12 48 8.09	1.8887	9 22 39.2	9.824	2	14 22 4.33	2.0365	16 21 8.8	7.337
3	12 50 1.48	1.8909	9 32 27.6	9.788	3	14 24 6.63	2.0401	16 28 26.9	7.267
4	12 51 55.00	1.8933	9 42 13.8	9.752	4	14 26 9.14	2.0437	16 35 40.8	7.196
5	12 53 48.67	1.8957	9 51 57.9	9.716	5	14 28 11.87	2.0473	16 42 50.4	7.124
6	12 55 42.48	1.8981	10 1 39.7	9.678	6	14 30 14.82	2.0510	16 49 55.7	7.052
7	12 57 36.44	1.9005	10 11 19.3	9.641	7	14 32 17.99	2.0547	16 56 56.7	6.979
8	12 59 30.54	1.9030	10 20 56.6	9.602	8	14 34 21.38	2.0583	17 3 53.2	6.906
9	13 1 24.80	1.9056	10 30 31.5	9.563	9	14 36 24.99	2.0621	17 10 45.4	6.832
10	13 3 19.21	1.9082	10 40 4.1	9.523	10	14 38 28.83	2.0657	17 17 33.0	6.756
11	13 5 13.78	1.9107	10 49 34.3	9.483	11	14 40 32.88	2.0693	17 24 16.1	6.680
12	13 7 8.50	1.9133	10 59 2.0	9.441	12	14 42 37.15	2.0730	17 30 54.6	6.603
13	13 9 3.38	1.9161	11 8 27.3	9.398	13	14 44 41.64	2.0768	17 37 28.6	6.527
14	13 10 58.43	1.9188	11 17 49.9	9.355	14	14 46 46.36	2.0804	17 43 57.9	6.448
15	13 12 53.64	1.9216	11 27 9.9	9.312	15	14 48 51.29	2.0841	17 50 22.4	6.369
16	13 14 49.02	1.9244	11 36 27.3	9.268	16	14 50 56.45	2.0877	17 56 42.2	6.290
17	13 16 44.57	1.9273	11 45 42.1	9.223	17	14 53 1.82	2.0913	18 2 57.2	6.209
18	13 18 40.29	1.9301	11 54 54.1	9.178	18	14 55 7.41	2.0950	18 9 7.3	6.128
19	13 20 36.18	1.9330	12 4 3.4	9.132	19	14 57 13.22	2.0988	18 15 12.6	6.047
20	13 22 32.25	1.9359	12 13 9.9	9.084	20	14 59 19.26	2.1024	18 21 12.9	5.963
21	13 24 28.49	1.9389	12 22 13.5	9.037	21	15 1 25.51	2.1060	18 27 8.2	5.880
22	13 26 24.91	1.9419	12 31 14.3	8.989	22	15 3 31.98	2.1097	18 32 58.5	5.796
23	15 28 21.52	1.9450	12 40 12.2	8.940	23	15 5 38.67	2.1133	18 38 43.7	5.710
24	13 30 18.31	1.9480	S. 12 49 7.1	8.890	24	15 7 45.57	2.1168	S. 18 44 23.7	5.625

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	WEDNESDAY 21.					FRIDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 7 45.57	2.1168	S.18 44 23.7	5.625	0	16 53 2.85	2.2559	S.21 23 20.5	0.782
1	15 9 52.69	2.1204	18 49 58.7	5.539	1	16 55 18.26	2.2577	21 24 4.0	0.668
2	15 12 0.02	2.1240	18 55 28.4	5.452	2	16 57 33.77	2.2594	21 24 40.7	0.555
3	15 14 7.57	2.1276	19 0 52.9	5.364	3	16 59 49.39	2.2612	21 25 10.6	0.442
4	15 16 15.33	2.1312	19 6 12.1	5.276	4	17 2 5.11	2.2628	21 25 33.7	0.328
5	15 18 23.31	2.1347	19 11 26.0	5.187	5	17 4 20.92	2.2643	21 25 49.9	0.213
6	15 20 31.49	2.1382	19 16 34.5	5.097	6	17 6 36.83	2.2659	21 25 59.3	− 0.100
7	15 22 39.89	2.1417	19 21 37.6	5.007	7	17 8 52.83	2.2673	21 26 1.9	+ 0.014
8	15 24 48.50	2.1452	19 26 35.3	4.916	8	17 11 8.91	2.2688	21 25 57.6	0.129
9	15 26 57.31	2.1486	19 31 27.5	4.823	9	17 13 25.08	2.2701	21 25 46.4	0.243
10	15 29 6.33	2.1520	19 36 14.1	4.730	10	17 15 41.32	2.2713	21 25 28.4	0.358
11	15 31 15.55	2.1554	19 40 55.1	4.637	11	17 17 57.64	2.2726	21 25 3.5	0.473
12	15 33 24.98	2.1588	19 45 30.5	4.543	12	17 20 14.03	2.2738	21 24 31.6	0.589
13	15 35 34.61	2.1622	19 50 0.3	4.448	13	17 22 30.49	2.2749	21 23 52.8	0.704
14	15 37 44.44	2.1655	19 54 24.3	4.353	14	17 24 47.02	2.2760	21 23 7.1	0.820
15	15 39 54.47	2.1688	19 58 42.6	4.258	15	17 27 3.61	2.2769	21 22 14.4	0.936
16	15 42 4.70	2.1721	20 2 55.2	4.162	16	17 29 20.25	2.2778	21 21 14.8	1.052
17	15 44 15.12	2.1753	20 7 2.0	4.064	17	17 31 36.95	2.2788	21 20 8.2	1.168
18	15 46 25.73	2.1785	20 11 2.9	3.966	18	17 33 53.71	2.2797	21 18 54.7	1.283
19	15 48 36.54	2.1817	20 14 57.9	3.868	19	17 36 10.51	2.2803	21 17 34.2	1.400
20	15 50 47.54	2.1848	20 18 47.0	3.768	20	17 38 27.35	2.2810	21 16 6.7	1.516
21	15 52 58.72	2.1879	20 22 30.1	3.668	21	17 40 44.23	2.2817	21 14 32.3	1.632
22	15 55 10.09	2.1911	20 26 7.2	3.568	22	17 43 1.15	2.2823	21 12 50.9	1.748
23	15 57 21.65	2.1942	S.20 29 38.3	3.468	23	17 45 18.11	2.2828	S.21 11 2.6	1.864
	THURSDAY 22.					SATURDAY 24.			
0	15 59 33.39	2.1972	S.20 33 3.3	3.366	0	17 47 35.09	2.2833	S.21 9 7.2	1.981
1	16 1 45.31	2.2001	20 36 22.2	3.264	1	17 49 52.10	2.2838	21 7 4.9	2.096
2	16 3 57.40	2.2030	20 39 35.0	3.162	2	17 52 9.14	2.2842	21 4 55.7	2.212
3	16 6 9.67	2.2059	20 42 41.7	3.058	3	17 54 26.20	2.2844	21 2 39.5	2.328
4	16 8 22.11	2.2088	20 45 42.1	2.954	4	17 56 43.27	2.2846	21 0 16.3	2.444
5	16 10 34.72	2.2116	20 48 36.2	2.850	5	17 59 0.35	2.2848	20 57 46.2	2.560
6	16 12 47.50	2.2143	20 51 24.1	2.746	6	18 1 17.44	2.2849	20 55 9.1	2.676
7	16 15 0.44	2.2170	20 54 5.7	2.640	7	18 3 34.54	2.2851	20 52 25.1	2.791
8	16 17 13.54	2.2197	20 56 40.9	2.534	8	18 5 51.65	2.2851	20 49 34.2	2.907
9	16 19 26.80	2.2223	20 59 9.8	2.428	9	18 8 8.75	2.2850	20 46 36.3	3.022
10	16 21 40.22	2.2249	21 1 32.2	2.321	10	18 10 25.85	2.2849	20 43 31.6	3.137
11	16 23 53.79	2.2274	21 3 48.3	2.214	11	18 12 42.94	2.2848	20 40 19.9	3.253
12	16 26 7.51	2.2299	21 5 57.9	2.106	12	18 15 0.02	2.2846	20 37 1.3	3.368
13	16 28 21.38	2.2323	21 8 1.0	1.998	13	18 17 17.09	2.2844	20 33 35.8	3.482
14	16 30 35.39	2.2348	21 9 57.6	1.889	14	18 19 34.15	2.2842	20 30 3.5	3.596
15	16 32 49.55	2.2372	21 11 47.7	1.781	15	18 21 51.19	2.2838	20 26 24.3	3.710
16	16 35 3.85	2.2394	21 13 31.3	1.671	16	18 24 8.20	2.2833	20 22 38.3	3.823
17	16 37 18.28	2.2417	21 15 8.2	1.560	17	18 26 25.19	2.2829	20 18 45.5	3.938
18	16 39 32.85	2.2438	21 16 38.5	1.450	18	18 28 42.15	2.2824	20 14 45.8	4.052
19	16 41 47.54	2.2459	21 18 2.2	1.339	19	18 30 59.08	2.2818	20 10 39.3	4.164
20	16 44 2.36	2.2481	21 19 19.2	1.228	20	18 33 15.97	2.2813	20 6 26.1	4.277
21	16 46 17.31	2.2501	21 20 29.6	1.117	21	18 35 32.83	2.2807	20 2 6.1	4.390
22	16 48 32.37	2.2520	21 21 33.3	1.005	22	18 37 49.65	2.2800	19 57 39.3	4.503
23	16 50 47.55	2.2540	21 22 30.2	0.893	23	18 40 6.43	2.2793	19 53 5.8	4.614
24	16 53 2.85	2.2559	S.21 23 20.5	0.782	24	18 42 23.16	2.2785	S.19 48 25.6	4.726

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 25.					TUESDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 42 23.16	2.2785	S.19 48 25.6	4.726	0	20 30 18.80	2.2126	S.14 2 28.3	9.451
1	18 44 39.85	2.2777	19 43 38.7	4.837	1	20 32 31.51	2.2111	13 52 58.8	9.533
2	18 46 56.49	2.2768	19 38 45.2	4.948	2	20 34 44.13	2.2096	13 43 24.4	9.613
3	18 49 13.07	2.2759	19 33 45.0	5.058	3	20 36 56.66	2.2081	13 33 45.2	9.693
4	18 51 29.60	2.2750	19 28 38.2	5.168	4	20 39 9.10	2.2067	13 24 1.2	9.773
5	18 53 46.07	2.2741	19 23 24.8	5.278	5	20 41 21.46	2.2053	13 14 12.5	9.850
6	18 56 2.48	2.2730	19 18 4.9	5.387	6	20 43 33.73	2.2038	13 4 19.2	9.928
7	18 58 18.83	2.2720	19 12 38.4	5.496	7	20 45 45.91	2.2023	12 54 21.2	10.004
8	19 0 35.12	2.2709	19 7 5.4	5.604	8	20 47 58.01	2.2010	12 44 18.7	10.080
9	19 2 51.34	2.2698	19 1 25.9	5.713	9	20 50 10.03	2.1996	12 34 11.6	10.155
10	19 5 7.50	2.2688	18 55 39.9	5.820	10	20 52 21.96	2.1983	12 24 0.1	10.228
11	19 7 23.59	2.2676	18 49 47.5	5.926	11	20 54 33.82	2.1969	12 13 44.2	10.302
12	19 9 39.61	2.2664	18 43 48.8	6.032	12	20 56 45.59	2.1956	12 3 23.9	10.374
13	19 11 55.56	2.2652	18 37 43.7	6.138	13	20 58 57.29	2.1943	11 52 59.3	10.445
14	19 14 11.43	2.2639	18 31 32.2	6.244	14	21 1 8.91	2.1931	11 42 30.5	10.516
15	19 16 27.22	2.2626	18 25 14.4	6.349	15	21 3 20.46	2.1919	11 31 57.4	10.586
16	19 18 42.94	2.2613	18 18 50.3	6.453	16	21 5 31.94	2.1908	11 21 20.2	10.654
17	19 20 58.58	2.2599	18 12 20.0	6.557	17	21 7 43.35	2.1896	11 10 38.9	10.722
18	19 23 14.13	2.2586	18 5 43.5	6.660	18	21 9 54.69	2.1884	10 59 53.6	10.788
19	19 25 29.61	2.2573	17 59 0.8	6.763	19	21 12 5.96	2.1873	10 49 4.3	10.855
20	19 27 45.00	2.2558	17 52 12.0	6.864	20	21 14 17.17	2.1863	10 38 11.0	10.920
21	19 30 0.30	2.2543	17 45 17.1	6.966	21	21 16 28.31	2.1852	10 27 13.8	10.983
22	19 32 15.52	2.2529	17 38 16.1	7.068	22	21 18 39.39	2.1843	10 16 12.9	11.047
23	19 34 30.65	2.2514	S.17 31 9.0	7.168	23	21 20 50.42	2.1833	S.10 5 8.2	11.108
	MONDAY 26.					WEDNESDAY 28.			
0	19 36 45.69	2.2500	S.17 23 56.0	7.267	0	21 23 1.38	2.1823	S. 9 53 59.9	11.169
1	19 39 0.65	2.2485	17 16 37.0	7.367	1	21 25 12.29	2.1814	9 42 47.9	11.230
2	19 41 15.51	2.2470	17 9 12.0	7.465	2	21 27 23.15	2.1806	9 31 32.3	11.289
3	19 43 30.29	2.2455	17 1 41.2	7.562	3	21 29 33.96	2.1798	9 20 13.2	11.347
4	19 45 44.97	2.2439	16 54 4.6	7.659	4	21 31 44.72	2.1790	9 8 50.6	11.405
5	19 47 59.56	2.2424	16 46 22.1	7.756	5	21 33 55.44	2.1783	8 57 24.6	11.462
6	19 50 14.06	2.2408	16 38 33.9	7.852	6	21 36 6.11	2.1775	8 45 55.2	11.518
7	19 52 28.46	2.2393	16 30 39.9	7.947	7	21 38 16.74	2.1768	8 34 22.5	11.572
8	19 54 42.77	2.2377	16 22 40.3	8.041	8	21 40 27.33	2.1763	8 22 46.6	11.626
9	19 56 56.98	2.2361	16 14 34.9	8.135	9	21 42 37.89	2.1757	8 11 7.4	11.678
10	19 59 11.10	2.2345	16 6 24.0	8.228	10	21 44 48.41	2.1751	7 59 25.2	11.729
11	20 1 25.12	2.2329	15 58 7.6	8.320	11	21 46 58.90	2.1746	7 47 39.9	11.780
12	20 3 39.05	2.2313	15 49 45.6	8.412	12	21 49 9.36	2.1742	7 35 51.6	11.829
13	20 5 52.88	2.2298	15 41 18.2	8.503	13	21 51 19.80	2.1738	7 24 0.4	11.878
14	20 8 6.62	2.2282	15 32 45.3	8.593	14	21 53 30.22	2.1734	7 12 6.3	11.926
15	20 10 20.26	2.2266	15 24 7.1	8.682	15	21 55 40.61	2.1731	7 0 9.3	11.973
16	20 12 33.81	2.2250	15 15 23.5	8.771	16	21 57 50.99	2.1728	6 48 9.6	12.018
17	20 14 47.26	2.2234	15 6 34.6	8.858	17	22 0 1.35	2.1726	6 36 7.2	12.063
18	20 17 0.62	2.2218	14 57 40.5	8.945	18	22 2 11.70	2.1724	6 24 2.1	12.106
19	20 19 13.88	2.2203	14 48 41.2	9.031	19	22 4 22.04	2.1723	6 11 54.5	12.148
20	20 21 27.05	2.2188	14 39 36.8	9.117	20	22 6 32.38	2.1723	5 59 44.3	12.190
21	20 23 40.13	2.2172	14 30 27.2	9.202	21	22 8 42.71	2.1723	5 47 31.7	12.230
22	20 25 53.11	2.2156	14 21 12.6	9.286	22	22 10 53.05	2.1723	5 35 16.7	12.269
23	20 28 6.00	2.2141	14 11 52.9	9.369	23	22 13 3.39	2.1723	5 22 59.4	12.308
24	20 30 18.80	2.2126	S.14 2 28.3	9.451	24	22 15 13.73	2.1724	S. 5 10 39.7	12.346

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 29.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.				Diff. for 1 Minute.
	h	m	s	s		°	′	″	″
0	22	15	13.73	2.1724	S.	5	10	39.7	12.346
1	22	17	24.08	2.1727		4	58	17.9	12.381
2	22	19	34.45	2.1729		4	45	54.0	12.416
3	22	21	44.83	2.1732		4	33	28.0	12.450
4	22	23	55.23	2.1735		4	21	0.0	12.483
5	22	26	5.65	2.1739		4	8	30.0	12.515
6	22	28	16.10	2.1743		3	55	58.2	12.546
7	22	30	26.57	2.1748		3	43	24.5	12.576
8	22	32	37.08	2.1754		3	30	49.1	12.603
9	22	34	47.62	2.1760		3	18	12.1	12.631
10	22	36	58.20	2.1767		3	5	33.4	12.658
11	22	39	8.82	2.1774		2	52	53.2	12.683
12	22	41	19.49	2.1782		2	40	11.4	12.707
13	22	43	30.21	2.1790		2	27	28.3	12.730
14	22	45	40.97	2.1798		2	14	43.8	12.752
15	22	47	51.79	2.1808		2	1	58.1	12.772
16	22	50	2.67	2.1818		1	49	11.2	12.792
17	22	52	13.61	2.1829		1	36	23.0	12.810
18	22	54	24.62	2.1840		1	23	33.9	12.828
19	22	56	35.69	2.1851		1	10	43.7	12.844
20	22	58	46.83	2.1863		0	57	52.6	12.858
21	23	0	58.05	2.1877		0	45	0.7	12.872
22	23	3	9.35	2.1890		0	32	8.0	12.884
23	23	5	20.73	2.1904	S.	0	19	14.6	12.896

FRIDAY 30.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.				Diff. for 1 Minute.
0	23	7	32.20	2.1918	S.	0	6	20.5	12.906
1	23	9	43.75	2.1933	N.	0	6	34.1	12.914
2	23	11	55.40	2.1949		0	19	29.2	12.922
3	23	14	7.14	2.1965		0	32	24.7	12.928
4	23	16	18.98	2.1982		0	45	20.6	12.934
5	23	18	30.92	2.1999		0	58	16.8	12.938
6	23	20	42.97	2.2018		1	11	13.1	12.940
7	23	22	55.13	2.2036		1	24	9.6	12.943
8	23	25	7.40	2.2054		1	37	6.2	12.943
9	23	27	19.78	2.2073		1	50	2.7	12.941
10	23	29	32.28	2.2094		2	2	59.1	12.939
11	23	31	44.91	2.2116		2	15	55.4	12.936
12	23	33	57.67	2.2137		2	28	51.4	12.931
13	23	36	10.55	2.2158		2	41	47.1	12.924
14	23	38	23.57	2.2182		2	54	42.3	12.917
15	23	40	36.73	2.2204		3	7	37.1	12.908
16	23	42	50.02	2.2228		3	20	31.3	12.898
17	23	45	3.46	2.2252		3	33	24.9	12.887
18	23	47	17.04	2.2276		3	46	17.7	12.874
19	23	49	30.77	2.2301		3	59	9.8	12.861
20	23	51	44.65	2.2327		4	12	1.0	12.845
21	23	53	58.69	2.2353		4	24	51.2	12.828
22	23	56	12.89	2.2379		4	37	40.4	12.811
23	23	58	27.24	2.2406		4	50	28.5	12.792
24	0	0	41.76	2.2434	N.	5	3	15.4	12.771

SATURDAY, DECEMBER 1.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.				Diff. for 1 Minute.
	h	m	s	s		°	′	″	″
0	0	0	41.76	2.2434	N.	5	3	15.4	12.771

PHASES OF THE MOON.

			d	h	m
○	Full Moon	Nov.	6	10	59.8
☾	Last Quarter		13	14	37.5
●	New Moon		21	19	17.2
☽	First Quarter		29	5	35.1

			d	h
☾	Perigee	Nov.	5	4.3
☾	Apogee		17	6.6

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Sun	W.	104 45 54	2653	106 23 37	2638	108 1 41	2623	109 40 5	2607
	Jupiter	W.	70 58 30	2395	72 42 12	2380	74 26 16	2364	76 10 42	2350
	Saturn	W.	52 22 20	2361	54 6 51	2346	55 51 44	2331	57 36 59	2317
	a Aquilæ	W.	32 30 49	4275	33 38 5	4082	34 48 24	3915	36 1 29	3766
	a Arietis	E.	72 14 5	2373	70 29 52	2360	68 45 20	2347	67 0 28	2334
	Aldebaran	E.	105 20 34	2347	103 35 43	2332	101 50 30	2317	100 4 56	2302
2	Sun	W.	117 57 18	2533	119 37 46	2518	121 18 33	2504	122 59 40	2492
	Jupiter	W.	84 57 59	2281	86 44 27	2267	88 31 15	2254	90 18 22	2241
	Saturn	W.	66 28 23	2247	68 15 41	2234	70 3 18	2220	71 51 15	2208
	a Aquilæ	W.	42 41 5	3231	44 6 37	3154	45 33 41	3083	47 2 11	3019
	a Arietis	E.	58 11 32	2273	56 24 53	2262	54 37 58	2252	52 50 48	2242
	Aldebaran	E.	91 11 53	2233	89 24 15	2220	87 36 18	2207	85 48 2	2194
3	Jupiter	W.	99 18 32	2182	101 7 26	2173	102 56 35	2163	104 45 59	2153
	Saturn	W.	80 55 36	2149	82 45 20	2139	84 35 19	2129	86 25 34	2120
	a Aquilæ	W.	54 42 34	2772	56 17 38	2735	57 53 32	2700	59 30 12	2668
	Aldebaran	E.	76 42 7	2138	74 52 6	2128	73 1 49	2118	71 11 17	2109
	Pollux	E.	118 33 7	2218	116 45 7	2205	114 56 47	2192	113 8 8	2180
4	Saturn	W.	95 40 8	2081	97 31 37	2075	99 23 16	2069	101 15 3	2064
	Fomalhaut	W.	42 28 6	3242	43 53 26	3156	45 20 28	3080	46 49 2	3013
	Aldebaran	E.	61 55 29	2073	60 3 48	2067	58 11 58	2062	56 20 2	2058
	Pollux	E.	104 0 44	2132	102 10 34	2124	100 20 12	2118	98 29 41	2113
5	Saturn	W.	110 35 32	2050	112 27 48	2049	114 20 6	2049	116 12 24	2050
	Fomalhaut	W.	54 30 7	2772	56 5 12	2738	57 41 1	2708	59 17 30	2683
	Aldebaran	E.	46 59 9	2052	45 6 55	2053	43 14 42	2055	41 22 33	2058
	Pollux	E.	89 15 23	2097	87 24 19	2097	85 33 15	2097	83 42 11	2097
	Mars	E.	119 22 25	2207	117 34 8	2205	115 45 48	2203	113 57 25	2203
6	Fomalhaut	W.	67 27 7	2599	69 6 3	2591	70 45 11	2584	72 24 29	2579
	Pollux	E.	74 27 47	2118	72 37 15	2125	70 46 54	2132	68 56 44	2140
	Mars	E.	104 55 47	2213	103 7 39	2218	101 19 39	2224	99 31 47	2229
	Regulus	E.	111 10 23	2060	109 18 22	2064	107 26 27	2069	105 34 40	2075
7	Fomalhaut	W.	80 41 39	2584	82 20 56	2591	84 0 4	2598	85 39 2	2607
	Pollux	E.	59 49 38	2198	58 1 8	2214	56 13 1	2229	54 25 17	2247
	Mars	E.	90 35 5	2272	88 48 25	2283	87 2 1	2295	85 15 54	2307
	Regulus	E.	96 18 27	2116	94 27 52	2127	92 37 34	2138	90 47 32	2149
8	*a* Arietis	W.	32 3 41	2328	33 48 59	2331	35 34 13	2336	37 19 20	2344
	Pollux	E.	45 33 32	2351	43 48 47	2377	42 4 39	2404	40 21 10	2433
	Mars	E.	76 30 1	2378	74 45 54	2393	73 2 9	2409	71 18 47	2426
	Regulus	E.	81 42 4	2216	79 54 1	2231	78 6 20	2247	76 19 2	2262
	Venus	E.	118 40 45	2598	117 1 47	2613	115 23 10	2629	113 44 55	2646
9	*a* Arietis	W.	46 1 44	2397	47 45 23	2410	49 28 43	2425	51 11 42	2440
	Mars	E.	62 48 14	2518	61 7 26	2538	59 27 5	2558	57 47 12	2577
	Regulus	E.	67 28 39	2349	65 43 51	2368	63 59 30	2386	62 15 35	2405
	Venus	E.	105 39 25	2735	104 3 32	2753	102 28 3	2772	100 52 59	2792
	Spica	E.	121 20 31	2325	119 35 8	2343	117 50 11	2360	116 5 39	2378

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV^{h}.	P. L. of Diff.	XVIII^{h}.	P. L. of Diff.	XXI^{h}.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	SUN	W.	111 18 50	2592	112 57 56	2577	114 37 23	2562	116 17 10	2547
	JUPITER	W.	77 55 28	2336	79 40 35	2322	81 26 3	2308	83 11 51	2294
	SATURN	W.	59 22 34	2302	61 8 30	2288	62 54 47	2274	64 41 25	2260
	α Aquilæ	W.	37 17 7	3635	38 35 4	3517	39 55 9	3412	41 17 12	3316
	α Arietis	E.	65 15 18	2321	63 29 49	2308	61 44 1	2296	59 57 55	2284
	Aldebaran	E.	98 19 1	2289	96 32 45	2274	94 46 8	2261	92 59 11	2247
2	SUN	W.	124 41 5	2479	126 22 48	2465	128 4 50	2453	129 47 9	2441
	JUPITER	W.	92 5 48	2229	93 53 32	2216	95 41 35	2205	97 29 55	2194
	SATURN	W.	73 39 31	2196	75 28 5	2183	77 16 58	2171	79 6 9	2160
	α Aquilæ	W.	48 32 0	2962	50 3 1	2907	51 35 11	2859	53 8 23	2813
	α Arietis	E.	51 3 23	2233	49 15 45	2225	47 27 54	2218	45 39 53	2212
	Aldebaran	E.	83 59 26	2182	82 10 32	2171	80 21 21	2160	78 31 52	2149
3	JUPITER	W.	106 35 38	2143	108 25 31	2136	110 15 36	2128	112 5 54	2120
	SATURN	W.	88 16 3	2111	90 6 46	2103	91 57 41	2094	93 48 49	2087
	α Aquilæ	W.	61 7 35	2639	62 45 37	2612	64 24 16	2587	66 3 29	2565
	Aldebaran	E.	69 20 32	2101	67 29 34	2092	65 38 23	2085	63 47 0	2079
	Pollux	E.	111 19 10	2169	109 29 56	2159	107 40 26	2149	105 50 42	2140
4	SATURN	W.	103 6 58	2060	104 58 59	2057	106 51 6	2053	108 43 17	2051
	Fomalhaut	W.	48 18 59	2954	49 50 10	2899	51 22 30	2852	52 55 51	2809
	Aldebaran	E.	54 27 58	2055	52 35 49	2053	50 43 37	2052	48 51 24	2051
	Pollux	E.	96 39 2	2108	94 48 15	2104	92 57 22	2101	91 6 24	2099
5	SATURN	W.	118 4 40	2052	119 56 54	2054	121 49 5	2057	123 41 10	2061
	Fomalhaut	W.	60 54 33	2660	62 32 6	2641	64 10 5	2624	65 48 27	2611
	Aldebaran	E.	39 30 29	2062	37 38 32	2068	35 46 44	2075	33 55 7	2083
	Pollux	E.	81 51 9	2100	80 0 10	2103	78 9 16	2107	76 18 28	2112
	MARS	E.	112 9 2	2204	110 20 40	2205	108 32 20	2206	106 44 2	2209
6	Fomalhaut	W.	74 3 53	2576	75 43 21	2576	77 22 49	2577	79 2 16	2580
	Pollux	E.	67 6 46	2150	65 17 3	2161	63 27 37	2173	61 38 29	2184
	MARS	E.	97 44 3	2237	95 56 30	2245	94 9 9	2253	92 22 0	2262
	Regulus	E.	103 43 2	2082	101 51 35	2090	100 0 20	2098	98 9 17	2106
7	Fomalhaut	W.	87 17 47	2618	88 56 18	2630	90 34 32	2644	92 12 27	2660
	Pollux	E.	52 37 59	2265	50 51 8	2284	49 4 45	2304	47 18 52	2327
	MARS	E.	83 30 4	2320	81 44 33	2333	79 59 22	2347	78 14 31	2362
	Regulus	E.	88 57 47	2161	87 8 21	2174	85 19 15	2188	83 30 29	2202
8	α Arietis	W.	39 4 16	2352	40 49 0	2361	42 33 31	2372	44 17 46	2384
	Pollux	E.	38 38 22	2465	36 56 20	2500	35 15 7	2538	33 34 46	2578
	MARS	E.	69 35 50	2444	67 53 18	2462	66 11 11	2480	64 29 29	2499
	Regulus	E.	74 32 7	2279	72 45 37	2297	70 59 33	2313	69 13 53	2331
	VENUS	E.	112 7 3	2663	110 29 34	2680	108 52 27	2698	107 15 44	2716
9	α Arietis	W.	52 54 20	2455	54 36 36	2471	56 18 30	2487	58 0 1	2504
	MARS	E.	56 7 46	2599	54 28 49	2620	52 50 21	2641	51 12 22	2663
	Regulus	E.	60 32 8	2424	58 49 8	2444	57 6 36	2464	55 24 31	2484
	VENUS	E.	99 18 21	2813	97 44 10	2832	96 10 24	2852	94 37 4	2872
	Spica	E.	114 21 33	2396	112 37 53	2415	110 54 40	2433	109 11 53	2452

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	*α* Arietis	W.	59 41 9	2521	61 21 53	2538	63 2 13	2555	64 42 10	2572
	Aldebaran	W.	26 27 48	2545	28 7 58	2555	29 47 55	2567	31 27 35	2580
	Mars	E.	49 34 52	2685	47 57 52	2707	46 21 22	2731	44 45 23	2753
	Regulus	F.	53 42 55	2504	52 1 47	2525	50 21 8	2545	48 40 57	2565
	Venus	E.	93 4 9	2893	91 31 41	2914	89 59 40	2934	88 28 4	2954
	Spica	E.	107 29 32	2470	105 47 37	2489	104 6 9	2508	102 25 7	2527
	Sun	E.	132 45 46	2805	131 11 25	2825	129 37 29	2845	128 3 58	2865
11	Aldebaran	W.	39 41 3	2656	41 18 42	2670	42 56 3	2686	44 33 2	2702
	Mars	E.	36 53 15	2876	35 20 26	2904	33 48 12	2932	32 16 33	2962
	Regulus	E.	40 27 12	2672	38 49 55	2695	37 13 8	2716	35 36 50	2740
	Venus	E.	80 56 32	3057	79 27 30	3078	77 58 53	3097	76 30 40	3117
	Spica	E.	94 6 25	2619	92 27 56	2638	90 49 52	2655	89 12 11	2673
	Sun	E.	120 22 54	2965	118 51 57	2984	117 21 24	3003	115 51 16	3022
12	Aldebaran	W.	52 32 30	2782	54 7 22	2796	55 41 54	2811	57 16 7	2827
	Mars	E.	24 48 4	3134	23 20 36	3179	21 54 2	3230	20 28 28	3288
	Venus	E.	69 15 31	3814	67 49 38	3232	66 24 7	3250	64 58 57	3267
	Spica	E.	81 9 43	2759	79 34 21	2775	77 59 20	2791	76 24 40	2806
	Sun	E.	108 26 24	3114	106 58 32	3133	105 31 2	3150	104 3 53	3167
13	Aldebaran	W.	65 2 29	2896	66 34 53	2909	68 7 0	2921	69 38 52	2934
	Pollux	W.	24 47 59	3325	26 11 41	3292	27 36 2	3265	29 0 54	3246
	Venus	E.	57 58 9	3352	56 34 58	3367	55 12 4	3382	53 49 27	3398
	Spica	E.	68 36 13	2879	67 3 27	2892	65 30 58	2905	63 58 46	2917
	Sun	E.	96 53 1	3245	95 27 45	3260	94 2 47	3274	92 38 5	3287
14	Aldebaran	W.	77 14 31	2989	78 44 58	2997	80 15 14	3006	81 45 19	3016
	Pollux	W.	36 9 52	3191	37 36 12	3186	39 2 38	3182	40 29 8	3179
	Venus	E.	47 0 32	3466	45 39 30	3480	44 18 44	3492	42 58 11	3504
	Spica	E.	56 21 29	2973	54 50 43	2983	53 20 9	2992	51 49 47	3001
	Sun	E.	85 38 20	3348	84 15 4	3358	82 52 0	3369	81 29 8	3379
15	Pollux	W.	47 42 11	3176	49 8 49	3175	50 35 28	3175	52 2 7	3174
	Venus	E.	36 18 42	3561	34 59 25	3572	33 40 20	3583	32 21 27	3594
	Spica	E.	44 20 33	3039	42 51 9	3046	41 21 53	3051	39 52 44	3056
	Sun	E.	74 37 21	3420	73 15 27	3426	71 53 40	3432	70 32 0	3438
16	Pollux	W.	59 15 17	3175	60 41 56	3175	62 8 35	3174	63 35 15	3173
	Mars	W.	24 4 18	3444	25 25 45	3429	26 47 29	3414	28 9 30	3401
	Regulus	W.	22 15 31	3220	23 41 18	3207	25 7 19	3196	26 33 33	3186
	Spica	E.	32 28 26	3077	30 59 48	3080	29 31 14	3082	28 2 43	3084
	Sun	E.	63 45 3	3458	62 23 52	3462	61 2 45	3464	59 41 41	3465
17	Pollux	W.	70 48 54	3167	72 15 43	3164	73 42 35	3161	75 9 30	3158
	Mars	W.	35 2 49	3353	36 25 59	3345	37 49 18	3338	39 12 46	3330
	Regulus	W.	33 47 20	3150	35 14 29	3144	36 41 45	3138	38 9 8	3133
	Sun	E.	52 56 37	3467	51 35 36	3467	50 14 35	3466	48 53 33	3464
18	Pollux	W.	82 24 59	3143	83 52 17	3139	85 19 39	3135	86 47 6	3130
	Mars	W.	46 12 3	3298	47 36 17	3291	49 0 39	3284	50 25 9	3277
	Regulus	W.	45 27 36	3107	46 55 37	3102	48 23 44	3096	49 51 58	3091

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV$^{\text{h}}$.	P. L. of Diff.	XVIII$^{\text{h}}$.	P. L. of Diff.	XXI$^{\text{h}}$.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
10	*a* Arietis	W.	66 21 43	2590	68 0 51	2607	69 39 36	2625	71 17 57	2643
	Aldebaran	W.	33 6 58	2595	34 46 0	2610	36 24 42	2625	38 3 3	2640
	MARS	E.	43 9 54	2777	41 34 56	2801	40 0 30	2825	38 26 36	2852
	Regulus	E.	47 1 14	2586	45 22 0	2607	43 43 15	2629	42 4 59	2650
	VENUS	E.	86 56 54	2975	85 26 10	2996	83 55 52	3016	82 25 59	3037
	Spica	E.	100 44 31	2546	99 4 22	2564	97 24 38	2583	95 45 19	2601
	SUN	E.	126 30 54	2885	124 58 16	2905	123 26 3	2925	121 54 16	2945
11	Aldebaran	W.	46 9 39	2718	47 45 55	2735	49 21 48	2751	50 57 20	2767
	MARS	E.	30 45 32	2991	29 15 8	3022	27 45 23	3057	26 16 21	3094
	Regulus	E.	34 1 3	2764	32 25 47	2787	30 51 2	2811	29 16 50	2836
	VENUS	E.	75 2 51	3137	73 35 26	3157	72 8 25	3176	70 41 47	3194
	Spica	E.	87 34 55	2691	85 58 3	2708	84 21 34	2725	82 45 27	2742
	SUN	E.	114 21 31	3042	112 52 10	3060	111 23 12	3079	109 54 37	3097
12	Aldebaran	W.	58 50 0	2842	60 23 34	2855	61 56 50	2869	63 29 48	2883
	MARS	E.	19 4 2	3355	17 40 54	3438	16 19 21	3538	14 59 39	3667
	VENUS	E.	63 34 7	3285	62 9 38	3302	60 45 29	3319	59 21 39	3336
	Spica	E.	74 50 20	2821	73 16 20	2836	71 42 39	2851	70 9 17	2865
	SUN	E.	102 37 4	3183	101 10 35	3199	99 44 25	3215	98 18 33	3231
13	Aldebaran	W.	71 10 28	2946	72 41 49	2956	74 12 57	2967	75 43 51	2978
	Pollux	W.	30 26 9	3229	31 51 44	3214	33 17 36	3204	34 43 40	3198
	VENUS	E.	52 27 8	3412	51 5 5	3427	49 43 19	3440	48 21 48	3454
	Spica	E.	62 26 49	2930	60 55 8	2941	59 23 41	2952	57 52 28	2963
	SUN	E.	91 13 38	3300	89 49 27	3313	88 25 31	3325	87 1 49	3336
14	Aldebaran	W.	83 15 12	3025	84 44 54	3033	86 14 26	3039	87 43 50	3043
	Pollux	W.	41 55 42	3178	43 22 18	3178	44 48 54	3176	46 15 32	3175
	VENUS	E.	41 37 51	3515	40 17 44	3528	38 57 51	3539	37 38 10	3551
	Spica	E.	50 19 36	3010	48 49 36	3018	47 19 46	3026	45 50 5	3033
	SUN	E.	80 6 27	3388	78 43 57	3396	77 21 36	3404	75 59 24	3412
15	Pollux	W.	53 28 45	3176	54 55 23	3176	56 22 1	3176	57 48 39	3176
	VENUS	E.	31 2 47	3605	29 44 18	3617	28 26 2	3630	27 8 0	3643
	Spica	E.	38 23 41	3062	36 54 45	3066	35 25 54	3070	33 57 8	3073
	SUN	E.	69 10 26	3443	67 48 58	3447	66 27 35	3451	65 6 17	3455
16	Pollux	W.	65 1 56	3173	66 28 38	3172	67 55 21	3170	69 22 6	3168
	MARS	W.	29 31 45	3390	30 54 13	3379	32 16 54	3368	33 39 47	3360
	Regulus	W.	27 59 59	3177	29 26 36	3168	30 53 23	3162	32 20 18	3156
	Spica	E.	26 34 14	3087	25 5 48	3088	23 37 23	3089	22 9 0	3090
	SUN	E.	58 20 38	3467	56 59 37	3467	55 38 36	3469	54 17 37	3468
17	Pollux	W.	76 36 29	3156	78 3 31	3153	79 30 36	3150	80 57 45	3146
	MARS	W.	40 36 23	3325	42 0 6	3318	43 23 57	3311	44 47 56	3304
	Regulus	W.	39 36 37	3129	41 4 12	3123	42 31 54	3118	43 59 42	3113
	SUN	E.	47 32 28	3462	46 11 21	3460	44 50 12	3457	43 29 0	3454
18	Pollux	W.	88 14 39	3126	89 42 17	3122	91 10 0	3117	92 37 49	3111
	MARS	W.	51 49 47	3271	53 14 32	3264	54 39 26	3257	56 4 28	3249
	Regulus	W.	51 20 19	3085	52 48 47	3079	54 17 22	3073	55 46 5	3067

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
18	Sun	E.	42 7 44	3451	40 46 25	3446	39 25 1	3442	38 3 32	3438
19	Pollux	W.	94 5 45	3107	95 33 46	3101	97 1 54	3096	98 30 8	3091
	Mars	W.	57 29 39	3242	58 54 58	3236	60 20 25	3228	61 46 1	3220
	Regulus	W.	57 14 55	3060	58 43 53	3054	60 12 59	3047	61 42 13	3040
	Sun	E.	31 14 49	3412	29 52 46	3406	28 30 36	3400	27 8 19	3393
23	Sun	W.	13 43 22	3153	15 10 28	3144	16 37 44	3136	18 5 10	3127
	Fomalhaut	E.	79 16 15	3293	77 51 55	3291	76 27 33	3289	75 3 8	3288
	a Pegasi	E.	96 50 26	2933	95 18 49	2924	93 47 1	2915	92 15 1	2906
24	Sun	W.	25 25 7	3082	26 53 39	3072	28 22 23	3063	29 51 18	3054
	Fomalhaut	E.	68 1 18	3300	66 37 7	3306	65 13 2	3313	63 49 6	3321
	a Pegasi	E.	84 32 22	2866	82 59 19	2859	81 26 9	2852	79 52 48	2845
25	Sun	W.	37 18 40	3009	38 48 42	2999	40 18 56	2990	41 49 21	2981
	Fomalhaut	E.	56 52 31	3393	55 30 6	3413	54 8 4	3437	52 46 29	3464
	a Pegasi	E.	72 3 58	2815	70 29 49	2811	68 55 33	2805	67 21 11	2800
	a Arietis	E.	115 12 24	2705	113 35 51	2696	111 59 6	2687	110 22 8	2676
26	Sun	W.	49 24 20	2935	50 55 55	2925	52 27 42	2916	53 59 40	2906
	Saturn	W.	19 44 41	2649	21 22 30	2638	23 0 34	2626	24 38 53	2616
	Fomalhaut	E.	46 7 31	3661	44 50 2	3718	43 33 34	3781	42 18 12	3853
	a Pegasi	E.	59 27 59	2783	57 53 9	2781	56 18 17	2782	54 43 24	2782
	a Arietis	E.	102 14 6	2631	100 35 53	2621	98 57 27	2612	97 18 49	2603
27	Sun	W.	61 42 36	2859	63 15 48	2848	64 49 13	2838	66 22 51	2829
	Saturn	W.	32 54 4	2564	34 33 48	2554	36 13 45	2544	37 53 57	2535
	Fomalhaut	E.	36 22 59	4390	35 17 29	4549	34 14 20	4733	33 13 48	4945
	a Pegasi	E.	46 49 27	2798	45 14 56	2805	43 40 34	2814	42 6 24	2826
	a Arietis	E.	89 2 32	2559	87 22 40	2549	85 42 35	2540	84 2 18	2531
	Aldebaran	E.	122 14 41	2540	120 34 24	2531	118 53 54	2521	117 13 11	2511
28	Sun	W.	74 14 12	2779	75 49 8	2769	77 24 16	2759	78 59 38	2749
	Saturn	W.	46 18 18	2486	47 59 51	2477	49 41 37	2467	51 23 37	2458
	a Aquilæ	W.	30 26 10	4817	31 25 32	4578	32 28 16	4368	33 34 6	4184
	a Pegasi	E.	34 20 53	2939	32 49 23	2978	31 18 43	3024	29 49 0	3081
	a Arietis	E.	75 37 48	2488	73 56 18	2479	72 14 35	2470	70 32 40	2462
	Aldebaran	E.	108 46 8	2463	107 4 3	2453	105 21 44	2444	103 39 12	2434
29	Sun	W.	86 59 48	2698	88 36 30	2688	90 13 26	2678	91 50 35	2668
	Saturn	W.	59 57 1	2409	61 40 23	2399	63 23 59	2389	65 7 49	2380
	a Aquilæ	W.	39 41 2	3549	41 0 32	3458	42 21 43	3378	43 44 25	3304
	a Arietis	E.	62 0 9	2422	60 17 5	2415	58 33 51	2407	56 50 26	2400
	Aldebaran	E.	95 3 4	2387	93 19 10	2377	91 35 2	2368	89 50 41	2358
30	Sun	W.	99 59 44	2618	101 38 14	2610	103 16 56	2601	104 55 51	2591
	Saturn	W.	73 50 18	2334	75 35 28	2325	77 20 51	2316	79 6 27	2308
	a Aquilæ	W.	50 57 0	3025	52 26 42	2982	53 57 17	2943	55 28 41	2906
	a Arietis	E.	48 10 55	2369	46 26 36	2365	44 42 11	2361	42 57 40	2358
	Aldebaran	E.	81 5 33	2313	79 19 52	2304	77 33 59	2296	75 47 53	2287
	Pollux	E.	122 50 46	2404	121 7 17	2391	119 23 30	2379	117 39 25	2366

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
18	SUN	E.	36 41 59	3434	35 20 21	3429	33 58 37	3423	32 36 46	3417
19	Pollux	W.	99 58 28	3086	101 26 55	3081	102 55 28	3075	104 24 8	3069
	MARS	W.	63 11 46	3213	64 37 40	3205	66 3 43	3197	67 29 56	3189
	Regulus	W.	63 11 36	3034	64 41 7	3027	66 10 46	3020	67 40 34	3012
	SUN	E.	25 45 55	3386	24 23 23	3379	23 0 43	3373	21 37 56	3365
23	SUN	W.	19 32 47	3117	21 0 36	3109	22 28 35	3099	23 56 46	3091
	Fomalhaut	E.	73 38 43	3288	72 14 18	3290	70 49 55	3293	69 25 35	3295
	a Pegasi	E.	90 42 50	2898	89 10 29	2890	87 37 57	2882	86 5 15	2873
24	SUN	W.	31 20 24	3045	32 49 41	3036	34 19 10	3027	35 48 49	3018
	Fomalhaut	E.	62 25 19	3332	61 1 44	3344	59 38 23	3358	58 15 18	3373
	a Pegasi	E.	78 19 19	2838	76 45 41	2832	75 11 55	2825	73 38 0	2820
25	SUN	W.	43 19 58	2972	44 50 46	2962	46 21 46	2953	47 52 57	2944
	Fomalhaut	E.	51 25 25	3495	50 4 55	3529	48 45 3	3567	47 25 53	3621
	a Pegasi	E.	65 46 42	2795	64 12 8	2792	62 37 29	2788	61 2 46	2785
	a Arietis	E.	108 44 56	2667	107 7 32	2658	105 29 56	2649	103 52 7	2640
26	SUN	W.	55 31 51	2897	57 4 14	2887	58 36 49	2878	60 9 36	2868
	SATURN	W.	26 17 26	2605	27 56 14	2594	29 35 17	2584	31 14 34	2574
	Fomalhaut	E.	41 4 4	3934	39 51 19	4027	38 40 6	4132	37 30 35	4253
	a Pegasi	E.	53 8 32	2782	51 33 40	2784	49 58 51	2787	48 24 6	2792
	a Arietis	E.	95 39 58	2594	94 0 55	2585	92 21 40	2576	90 42 12	2567
27	SUN	W.	67 56 41	2818	69 30 45	2809	71 5 1	2799	72 39 30	2789
	SATURN	W.	39 34 22	2525	41 15 1	2515	42 55 53	2505	44 36 59	2496
	Fomalhaut	E.	32 16 9	5190	31 21 40	5477	30 30 40	5818	29 43 31	6223
	a Pegasi	E.	40 32 30	2842	38 58 56	2860	37 25 46	2882	35 53 4	2906
	a Arietis	E.	82 21 48	2522	80 41 6	2514	79 0 12	2505	77 19 6	2497
	Aldebaran	E.	115 32 13	2502	113 51 2	2492	112 9 37	2482	110 27 59	2473
28	SUN	W.	80 35 13	2739	82 11 1	2729	83 47 3	2718	85 23 19	2708
	SATURN	W.	53 5 50	2448	54 48 17	2438	56 30 58	2428	58 13 53	2419
	a Aquilæ	W.	34 42 47	4026	35 54 1	3886	37 7 35	3760	38 23 19	3648
	a Pegasi	E.	28 20 28	3151	26 53 21	3236	25 27 54	3340	24 4 29	3471
	a Arietis	E.	68 50 33	2453	67 8 14	2445	65 25 44	2437	63 43 2	2429
	Aldebaran	E.	101 56 26	2424	100 13 26	2415	98 30 12	2405	96 46 45	2396
29	SUN	W.	93 27 58	2658	95 5 34	2648	96 43 24	2638	98 21 27	2628
	SATURN	W.	66 51 52	2371	68 36 9	2362	70 20 38	2353	72 5 21	2343
	a Aquilæ	W.	45 8 32	3238	46 33 56	3177	48 0 33	3123	49 28 15	3071
	a Arietis	E.	55 6 51	2392	53 23 5	2386	51 39 10	2380	49 55 7	2374
	Aldebaran	E.	88 6 6	2349	86 21 18	2340	84 36 16	2331	82 51 1	2322
30	SUN	W.	106 34 58	2582	108 14 18	2573	109 53 50	2564	111 33 35	2556
	SATURN	W.	80 52 15	2300	82 38 15	2291	84 24 28	2283	86 10 53	2274
	a Aquilæ	W.	57 0 52	2873	58 33 46	2842	60 7 20	2813	61 41 32	2786
	a Arietis	E.	41 13 5	2357	39 28 27	2357	37 43 50	2355	35 59 9	2358
	Aldebaran	E.	74 1 35	2279	72 15 5	2271	70 28 23	2264	68 41 30	2256
	Pollux	E.	115 55 3	2355	114 10 24	2345	112 25 30	2335	110 40 21	2325

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	16 28 35.90	10.790	S. 21 47 20.2	−23.52	16 14.63	70.19	10 55.07	0.933
SUN.	2	16 32 55.23	10.816	21 56 32.1	22.46	16 14.78	70.27	10 32.36	0.959
Mon.	3	16 37 15.18	10.841	22 5 18.5	21.40	16 14.93	70.35	10 9.02	0.984
Tues.	4	16 41 35.72	10.865	22 13 39.4	−20.33	16 15.08	70.43	9 45.11	1.008
Wed.	5	16 45 56.83	10.888	22 21 34.4	19.24	16 15.22	70.50	9 20.64	1.031
Thur.	6	16 50 18.48	10.910	22 29 3.3	18.15	16 15.35	70.58	8 55.61	1.053
Frid.	7	16 54 40.66	10.932	22 36 5.9	−17.05	16 15.47	70.65	8 30.05	1.075
Sat.	8	16 59 3.35	10.953	22 42 42.0	15.94	16 15.59	70.72	8 3.99	1.096
SUN.	9	17 3 26.53	10.972	22 48 51.2	14.82	16 15.71	70.78	7 37.44	1.115
Mon.	10	17 7 50.17	10.990	22 54 33.5	−13.69	16 15.82	70.84	7 10.44	1.134
Tues.	11	17 12 14.25	11.008	22 59 48.7	12.56	16 15.93	70.89	6 42.99	1.152
Wed.	12	17 16 38.72	11.024	23 4 36.4	11.42	16 16.04	70.94	6 15.14	1.168
Thur.	13	17 21 3.58	11.039	23 8 56.7	−10.26	16 16.14	70.99	5 46.92	1.183
Frid.	14	17 25 28.78	11.053	23 12 49.4	9.11	16 16.23	71.03	5 18.35	1.197
Sat.	15	17 29 54.29	11.065	23 16 14.3	7.95	16 16.32	71.07	4 49.48	1.209
SUN.	16	17 34 20.09	11.076	23 19 11.2	− 6.79	16 16.41	71.10	4 20.33	1.220
Mon.	17	17 38 46.12	11.086	23 21 40.1	5.62	16 16.50	71.13	3 50.93	1.229
Tues.	18	17 43 12.37	11.094	23 23 40.9	4.45	16 16.58	71.16	3 21.32	1.237
Wed.	19	17 47 38.79	11.100	23 25 13.5	− 3.27	16 16.65	71.17	2 51.54	1.243
Thur.	20	17 52 5.34	11.105	23 26 17.9	2.10	16 16.72	71.18	2 21.62	1.248
Frid.	21	17 56 32.00	11.109	23 26 54.1	− 0.92	16 16.78	71.19	1 51.61	1.251
Sat.	22	18 0 58.73	11.110	23 27 1.8	+ 0.26	16 16.83	71.19	1 21.53	1.253
SUN.	23	18 5 25.46	11.110	23 26 41.3	1.44	16 16.88	71.19	0 51.44	1.253
Mon.	24	18 9 52.17	11.108	23 25 52.5	2.62	16 16.92	71.19	0 21.37	1.251
Tues.	25	18 14 18.82	11.105	23 24 35.4	+ 3.80	16 16.96	71.19	0 8.65	1.248
Wed.	26	18 18 45.38	11.100	23 22 50.2	4.98	16 17.00	71.18	0 38.57	1.243
Thur.	27	18 23 11.81	11.094	23 20 36.6	6.15	16 17.04	71.17	1 8.36	1.237
Frid.	28	18 27 38.06	11.086	23 17 54.9	+ 7.32	16 17.07	71.15	1 37.98	1.229
Sat.	29	18 32 4.11	11.077	23 14 45.3	8.48	16 17.10	71.12	2 7.39	1.220
SUN.	30	18 36 29.92	11.066	23 11 7.7	9.64	16 17.12	71.09	2 36.56	1.210
Mon.	31	18 40 55.46	11.054	23 7 2.2	10.80	16 17.13	71.05	3 5.46	1.198
Tues.	32	18 45 20.71	11.041	S. 23 2 29.1	+11.95	16 17.13	71.01	3 34.07	1.185

NOTE.—The mean time of semidiameter passing may be found by subtracting $0^{s}.19$ from the sidereal time.
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	16 28 37.86	10.790	S. 21 47 24.5	−23.51	10 54.90	0.933	16 39 32.76
SUN.	2	16 32 57.13	10.816	21 56 36.0	22.45	10 32.19	0.959	16 43 29.32
Mon.	3	16 37 17.01	10.841	22 5 22.1	21.39	10 8.86	0.984	16 47 25.88
Tues.	4	16 41 37.48	10.865	22 13 42.7	−20.32	9 44.95	1.008	16 51 22.43
Wed.	5	16 45 58.52	10.888	22 21 37.4	19.23	9 20.48	1.031	16 55 18.99
Thur.	6	16 50 20.10	10.910	22 29 6.0	18.14	8 55.45	1.053	16 59 15.55
Frid.	7	16 54 42.21	10.932	22 36 8.3	−17.04	8 29.90	1.075	17 3 12.11
Sat.	8	16 59 4.82	10.953	22 42 44.1	15.93	8 3.84	1.096	17 7 8.66
SUN.	9	17 3 27.92	10.972	22 48 53.1	14.81	7 37.30	1.115	17 11 5.22
Mon.	10	17 7 51.48	10.990	22 54 35.1	−13.68	7 10.30	1.134	17 15 1.78
Tues.	11	17 12 15.48	11.008	22 59 50.1	12.55	6 42.86	1.152	17 18 58.34
Wed.	12	17 16 39.87	11.024	23 4 37.6	11.41	6 15.02	1.168	17 22 54.89
Thur.	13	17 21 4.64	11.039	23 8 57.7	−10.26	5 46.81	1.183	17 26 51.45
Frid.	14	17 25 29.76	11.053	23 12 50.2	9.11	5 18.25	1.197	17 30 48.01
Sat.	15	17 29 55.18	11.065	23 16 14.9	7.95	4 49.38	1.209	17 34 44.56
SUN.	16	17 34 20.89	11.076	23 19 11.7	− 6.79	4 20.24	1.220	17 38 41.12
Mon.	17	17 38 46.83	11.086	23 21 40.5	5.62	3 50.85	1.229	17 42 37.68
Tues.	18	17 43 12.99	11.094	23 23 41.2	4.45	3 21.25	1.237	17 46 34.24
Wed.	19	17 47 39.32	11.100	23 25 13.7	− 3.27	2 51.48	1.243	17 50 30.80
Thur.	20	17 52 5.78	11.105	23 26 18.0	2.10	2 21.57	1.248	17 54 27.35
Frid.	21	17 56 32.34	11.109	23 26 54.1	− 0.92	1 51.57	1.251	17 58 23.91
Sat.	22	18 0 58.97	11.110	23 27 1.8	+ 0.26	1 21.50	1.253	18 2 20.47
SUN.	23	18 5 25.61	11.110	23 26 41.3	1.44	0 51.42	1.253	18 6 17.03
Mon.	24	18 9 52.23	11.108	23 25 52.5	2.62	0 21.36	1.251	18 10 13.59
Tues.	25	18 14 18.79	11.105	23 24 35.4	+ 3.80	0 8.65	1.248	18 14 10.14
Wed.	26	18 18 45.26	11.100	23 22 50.2	4.98	0 38.56	1.243	18 18 6.70
Thur.	27	18 23 11.60	11.094	23 20 36.7	6.15	1 8.34	1.237	18 22 3.26
Frid.	28	18 27 37.76	11.086	23 17 55.1	+ 7.32	1 37.95	1.229	18 25 59.82
Sat.	29	18 32 3.72	11.077	23 14 45.6	8.48	2 7.35	1.220	18 29 56.37
SUN.	30	18 36 29.44	11.066	23 11 8.1	9.64	2 36.51	1.210	18 33 52.93
Mon.	31	18 40 54.89	11.054	23 7 2.8	10.80	3 5.40	1.198	18 37 49.49
Tues.	32	18 45 20.05	11.041	S. 23 2 29.8	+11.95	3 34.00	1.185	18 41 46.05

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 Hour,
+ 9s.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	335	248 52 38.7	51 38.3	152.12	+ 0.29	9.9937534	−29.4	7 19 15.08
2	336	249 53 29.9	52 29.2	152.16	0.21	9.9936837	28.5	7 15 19.17
3	337	250 54 21.9	53 21.1	152.19	+ 0.10	9.9936164	27.5	7 11 23.26
4	338	251 55 14.8	54 13.8	152.22	− 0.04	9.9935515	−26.5	7 7 27.34
5	339	252 56 8.5	55 7.4	152.26	0.17	9.9934892	25.4	7 3 31.43
6	340	253 57 3.2	56 2.0	152.30	0.30	9.9934295	24.3	6 59 35.52
7	341	254 57 59.0	56 57.5	152.34	− 0.44	9.9933725	−23.2	6 55 39.61
8	342	255 58 55.7	57 54.0	152.39	0.57	9.9933182	22.1	6 51 43.70
9	343	256 59 53.4	58 51.6	152.43	0.67	9.9932665	21.0	6 47 47.79
10	344	257 60 52.3	59 50.3	152.48	− 0.75	9.9932173	−20.0	6 43 51.88
11	345	259 1 52.2	0 50.1	152.52	0.79	9.9931705	19.0	6 39 55.97
12	346	260 2 53.2	1 50.8	152.57	0.80	9.9931261	18.0	6 36 0.05
13	347	261 3 55.2	2 52.7	152.61	− 0.78	9.9930839	−17.1	6 32 4.14
14	348	262 4 58.2	3 55.6	152.65	0.73	9.9930440	16.2	6 28 8.23
15	349	263 6 2.2	4 59.3	152.69	0.67	9.9930060	15.4	6 24 12.32
16	350	264 7 7.1	6 4.1	152.73	− 0.57	9.9929701	−14.6	6 20 16.41
17	351	265 8 12.8	7 9.7	152.76	0.46	9.9929361	13.8	6 16 20.50
18	352	266 9 19.4	8 16.0	152.79	0.34	9.9929040	13.0	6 12 24.58
19	353	267 10 26.7	9 23.2	152.82	− 0.20	9.9928736	−12.3	6 8 28.67
20	354	268 11 34.7	10 31.0	152.84	− 0.07	9.9928449	11.6	6 4 32.76
21	355	269 12 43.2	11 39.3	152.86	+ 0.05	9.9928179	10.9	6 0 36.85
22	356	270 13 52.3	12 48.2	152.88	+ 0.18	9.9927925	−10.2	5 56 40.94
23	357	271 15 1.6	13 57.4	152.90	0.28	9.9927687	9.5	5 52 45.02
24	358	272 16 11.3	15 6.9	152.91	0.37	9.9927465	8.8	5 48 49.11
25	359	273 17 21.2	16 16.5	152.91	+ 0.42	9.9927260	− 8.1	5 44 53.20
26	360	274 18 31.1	17 26.3	152.91	0.43	9.9927074	7.4	5 40 57.29
27	361	275 19 41.0	18 36.0	152.91	0.43	9.9926906	6.6	5 37 1.38
28	362	276 20 50.8	19 45.7	152.91	+ 0.38	9.9926759	− 5.7	5 33 5.47
29	363	277 22 0.5	20 55.2	152.90	0.29	9.9926634	4.8	5 29 9.55
30	364	278 23 10.1	22 4.6	152.89	0.17	9.9926532	3.8	5 25 13.64
31	365	279 24 19.4	23 13.7	152.88	+ 0.05	9.9926454	2.6	5 21 17.73
32	366	280 25 28.5	24 22.7	152.86	− 0.07	9.9926404	− 1.3	5 17 21.82

NOTE.—The numbers in column λ correspond to the true equinox of the date; in column λ′ to the mean equinox of January $0^{d}.0$.

Diff. for 1 Hour,
$-9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 16.8	16 19.6	59 38.2	+0.95	59 48.8	+0.80	7 37.1	2.18	9.2
2	16 22.0	16 23.6	59 57.4	0.61	60 3.5	+0.40	8 30.5	2.28	10.2
3	16 24.6	16 24.7	60 7.0	+0.16	60 7.4	−0.10	9 26.4	2.38	11.2
4	16 24.0	16 22.3	60 4.7	−0.37	59 58.6	−0.65	10 24.8	2.47	12.2
5	16 19.7	16 16.3	59 49.2	0.92	59 36.5	1.18	11 24.6	2.51	13.2
6	16 12.0	16 7.1	59 20.9	1.41	59 2.6	1.62	12 24.5	2.46	14.2
7	16 1.5	15 55.4	58 42.1	−1.79	58 19.7	−1.91	13 22.4	2.35	15.2
8	15 49.0	15 42.3	57 56.1	2.00	57 31.7	2.04	14 17.1	2.20	16.2
9	15 35.6	15 29.0	57 7.1	2.04	56 42.7	2.00	15 8.2	2.05	17.2
10	15 22.5	15 16.4	56 19.1	−1.91	55 56.7	−1.80	15 55.7	1.92	18.2
11	15 10.8	15 5.6	55 35.9	1.66	55 16.9	1.50	16 40.4	1.81	19.2
12	15 1.0	14 57.0	55 0.0	1.31	54 45.4	1.11	17 23.1	1.75	20.2
13	14 53.7	14 51.1	54 33.3	−0.90	54 23.7	−0.68	18 4.8	1.73	21.2
14	14 49.2	14 48.1	54 16.8	0.46	54 12.6	−0.24	18 46.4	1.74	22.2
15	14 47.7	14 47.9	54 11.0	−0.05	54 11.9	+0.18	19 28.8	1.79	23.2
16	14 48.9	14 50.4	54 15.4	+0.38	54 21.1	+0.57	20 12.8	1.87	24.2
17	14 52.6	14 55.3	54 29.0	0.74	54 38.9	0.90	20 59.0	1.97	25.2
18	14 58.4	15 2.0	54 50.6	1.03	55 3.8	1.15	21 47.6	2.08	26.2
19	15 6.0	15 10.2	55 18.3	+1.25	55 33.7	+1.32	22 38.6	2.17	27.2
20	15 14.6	15 19.1	55 49.9	1.36	56 6.6	1.39	23 31.5	2.23	28.2
21	15 23.7	15 28.3	56 23.4	1.40	56 40.1	1.38	δ		29.2
22	15 32.7	15 37.0	56 56.5	+1.34	57 12.3	+1.30	0 25.2	2.24	0.5
23	15 41.2	15 45.1	57 27.5	1.23	57 41.9	1.15	1 18.8	2.22	1.5
24	15 48.7	15 52.1	57 55.3	1.07	58 7.7	0.99	2 11.5	2.17	2.5
25	15 55.2	15 58.0	58 19.0	+0.90	58 29.3	+0.82	3 3.0	2.12	3.5
26	16 0.5	16 2.8	58 38.6	0.73	58 46.9	0.65	3 53.4	2.09	4.5
27	16 4.8	16 6.5	58 54.2	0.57	59 0.6	0.49	4 43.3	2.08	5.5
28	16 8.0	16 9.2	59 6.0	+0.40	59 10.3	+0.33	5 33.6	2.11	6.5
29	16 10.1	16 10.7	59 13.7	0.23	59 16.0	+0.14	6 25.0	2.18	7.5
30	16 11.0	16 10.9	59 17.0	+0.03	59 16.8	−0.08	7 18.2	2.26	8.5
31	16 10.4	16 9.5	59 15.0	−0.21	59 11.7	−0.35	8 13.7	2.36	9.5
32	16 8.2	16 6.3	59 6.6	−0.49	58 59.8	−0.65	9 11.1	2.42	10.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SATURDAY 1.			
	h m s	s	° ′ ″	″
0	0 0 41.76	2.2434	N. 5 3 15.4	12.771
1	0 2 56.45	2.2462	5 16 1.0	12.748
2	0 5 11.31	2.2492	5 28 45.2	12.725
3	0 7 26.35	2.2521	5 41 28.0	12.701
4	0 9 41.56	2.2550	5 54 9.3	12.674
5	0 11 56.95	2.2581	6 6 48.9	12.647
6	0 14 12.53	2.2612	6 19 26.9	12.618
7	0 16 28.29	2.2643	6 32 3.0	12.587
8	0 18 44.24	2.2674	6 44 37.3	12.556
9	0 21 0.38	2.2707	6 57 9.7	12.523
10	0 23 16.72	2.2739	7 9 40.1	12.488
11	0 25 33.25	2.2772	7 22 8.3	12.452
12	0 27 49.98	2.2805	7 34 34.4	12.416
13	0 30 6.91	2.2839	7 46 58.2	12.377
14	0 32 24.05	2.2874	7 59 19.6	12.336
15	0 34 41.40	2.2908	8 11 38.5	12.294
16	0 36 58.95	2.2942	8 23 54.9	12.252
17	0 39 16.71	2.2978	8 36 8.7	12.207
18	0 41 34.69	2.3015	8 48 19.7	12.160
19	0 43 52.89	2.3051	9 0 27.9	12.113
20	0 46 11.30	2.3087	9 12 33.3	12.065
21	0 48 29.93	2.3124	9 24 35.7	12.014
22	0 50 48.79	2.3162	9 36 35.0	11.962
23	0 53 7.87	2.3199	N. 9 48 31.1	11.909
	SUNDAY 2.			
0	0 55 27.18	2.3237	N.10 0 24.1	11.855
1	0 57 46.72	2.3275	10 12 13.7	11.798
2	1 0 6.48	2.3313	10 23 59.9	11.741
3	1 2 26.48	2.3352	10 35 42.6	11.681
4	1 4 46.70	2.3390	10 47 21.6	11.620
5	1 7 7.16	2.3430	10 58 57.0	11.558
6	1 9 27.86	2.3470	11 10 28.7	11.495
7	1 11 48.80	2.3509	11 21 56.5	11.430
8	1 14 9.97	2.3548	11 33 20.3	11.363
9	1 16 31.38	2.3588	11 44 40.1	11.295
10	1 18 53.03	2.3628	11 55 55.7	11.225
11	1 21 14.92	2.3669	12 7 7.1	11.155
12	1 23 37.06	2.3710	12 18 14.3	11.082
13	1 25 59.44	2.3750	12 29 17.0	11.008
14	1 28 22.06	2.3790	12 40 15.3	10.933
15	1 30 44.92	2.3831	12 51 9.0	10.856
16	1 33 8.03	2.3872	13 1 58.0	10.777
17	1 35 31.38	2.3912	13 12 42.3	10.697
18	1 37 54.98	2.3953	13 23 21.7	10.617
19	1 40 18.82	2.3994	13 33 56.3	10.534
20	1 42 42.91	2.4035	13 44 25.8	10.449
21	1 45 7.24	2.4076	13 54 50.2	10.363
22	1 47 31.82	2.4117	14 5 9.4	10.276
23	1 49 56.64	2.4158	14 15 23.3	10.187
24	1 52 21.72	2.4199	N.14 25 31.9	10.098

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	MONDAY 3.			
	h m s	s	° ′ ″	″
0	1 52 21.72	2.4199	N.14 25 31.9	10.098
1	1 54 47.03	2.4238	14 35 35.1	10.007
2	1 57 12.58	2.4279	14 45 32.7	9.914
3	1 59 38.38	2.4320	14 55 24.8	9.820
4	2 2 4.42	2.4360	15 5 11.1	9.723
5	2 4 30.70	2.4400	15 14 51.6	9.627
6	2 6 57.22	2.4439	15 24 26.3	9.528
7	2 9 23.97	2.4478	15 33 55.0	9.428
8	2 11 50.96	2.4517	15 43 17.7	9.327
9	2 14 18.18	2.4557	15 52 34.2	9.224
10	2 16 45.64	2.4596	16 1 44.6	9.121
11	2 19 13.33	2.4633	16 10 48.7	9.015
12	2 21 41.24	2.4672	16 19 46.4	8.908
13	2 24 9.39	2.4710	16 28 37.7	8.801
14	2 26 37.76	2.4747	16 37 22.5	8.691
15	2 29 6.35	2.4783	16 46 0.6	8.580
16	2 31 35.16	2.4820	16 54 32.1	8.469
17	2 34 4.19	2.4856	17 2 56.9	8.356
18	2 36 33.43	2.4892	17 11 14.8	8.242
19	2 39 2.89	2.4927	17 19 25.9	8.127
20	2 41 32.56	2.4962	17 27 30.0	8.009
21	2 44 2.43	2.4995	17 35 27.1	7.891
22	2 46 32.50	2.5028	17 43 17.0	7.772
23	2 49 2.77	2.5062	N.17 50 59.8	7.652
	TUESDAY 4.			
0	2 51 33.24	2.5094	N.17 58 35.3	7.531
1	2 54 3.90	2.5126	18 6 3.5	7.408
2	2 56 34.75	2.5157	18 13 24.3	7.284
3	2 59 5.79	2.5188	18 20 37.6	7.159
4	3 1 37.01	2.5217	18 27 43.4	7.034
5	3 4 8.40	2.5247	18 34 41.7	6.907
6	3 6 39.97	2.5275	18 41 32.3	6.779
7	3 9 11.70	2.5302	18 48 15.2	6.650
8	3 11 43.59	2.5328	18 54 50.3	6.520
9	3 14 15.64	2.5355	19 1 17.6	6.389
10	3 16 47.85	2.5381	19 7 37.0	6.257
11	3 19 20.21	2.5405	19 13 48.5	6.125
12	3 21 52.71	2.5428	19 19 52.0	5.992
13	3 24 25.35	2.5452	19 25 47.5	5.857
14	3 26 58.13	2.5473	19 31 34.9	5.722
15	3 29 31.03	2.5493	19 37 14.1	5.586
16	3 32 4.05	2.5513	19 42 45.2	5.449
17	3 34 37.19	2.5533	19 48 8.0	5.311
18	3 37 10.45	2.5552	19 53 22.5	5.172
19	3 39 43.81	2.5568	19 58 28.7	5.033
20	3 42 17.27	2.5584	20 3 26.5	4.894
21	3 44 50.82	2.5599	20 8 16.0	4.754
22	3 47 24.46	2.5613	20 12 57.0	4.613
23	3 49 58.18	2.5627	20 17 29.5	4.472
24	3 52 31.98	2.5639	N.20 21 53.6	4.330

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute	Declination.	Diff. for 1 Minute
WEDNESDAY 5.					FRIDAY 7.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 52 31.98	2.5639	N.20 21 53.6	4.330	0	5 54 52.55	2.4908	N.21 2 42.4	2.553
1	3 55 5.85	2.5650	20 26 9.1	4.187	1	5 57 21.88	2.4868	21 0 5.2	2.687
2	3 57 39.78	2.5660	20 30 16.0	4.043	2	5 59 50.97	2.4827	20 57 20.0	2.818
3	4 0 13.77	2.5669	20 34 14.3	3.900	3	6 2 19.80	2.4783	20 54 27.0	2.949
4	4 2 47.81	2.5677	20 38 4.0	3.756	4	6 4 48.37	2.4740	20 51 26.1	3.079
5	4 5 21.90	2.5684	20 41 45.1	3.612	5	6 7 16.68	2.4696	20 48 17.5	3.208
6	4 7 56.02	2.5689	20 45 17.5	3.467	6	6 9 44.72	2.4651	20 45 1.1	3.337
7	4 10 30.17	2.5694	20 48 41.2	3.322	7	6 12 12.49	2.4606	20 41 37.0	3.465
8	4 13 4.35	2.5697	20 51 56.1	3.176	8	6 14 39.99	2.4559	20 38 5.3	3.592
9	4 15 38.54	2.5700	20 55 2.3	3.031	9	6 17 7.20	2.4511	20 34 26.0	3.717
10	4 18 12.75	2.5702	20 57 59.8	2.885	10	6 19 34.12	2.4462	20 30 39.2	3.842
11	4 20 46.96	2.5701	21 0 48.5	2.738	11	6 22 0.75	2.4415	20 26 45.0	3.965
12	4 23 21.16	2.5700	21 3 28.4	2.592	12	6 24 27.10	2.4367	20 22 43.4	4.087
13	4 25 55.36	2.5698	21 5 59.5	2.445	13	6 26 53.15	2.4316	20 18 34.5	4.209
14	4 28 29.54	2.5694	21 8 21.8	2.298	14	6 29 18.89	2.4265	20 14 18.3	4.330
15	4 31 3.69	2.5690	21 10 35.3	2.152	15	6 31 44.33	2.4214	20 9 54.9	4.448
16	4 33 37.82	2.5685	21 12 40.0	2.005	16	6 34 9.46	2.4162	20 5 24.5	4.567
17	4 36 11.91	2.5678	21 14 35.9	1.858	17	6 36 34.28	2.4111	20 0 46.9	4.685
18	4 38 45.95	2.5669	21 16 23.0	1.711	18	6 38 58.79	2.4058	19 56 2.3	4.801
19	4 41 19.94	2.5660	21 18 1.2	1.563	19	6 41 22.98	2.4004	19 51 10.8	4.916
20	4 43 53.87	2.5649	21 19 30.6	1.417	20	6 43 46.84	2.3950	19 46 12.4	5.030
21	4 46 27.73	2.5638	21 20 51.2	1.271	21	6 46 10.38	2.3897	19 41 7.2	5.142
22	4 49 1.53	2.5626	21 22 3.1	1.124	22	6 48 33.60	2.3842	19 35 55.3	5.254
23	4 51 35.24	2.5612	N.21 23 6.1	0.978	23	6 50 56.49	2.3787	N.19 30 36.7	5.365
THURSDAY 6.					SATURDAY 8.				
0	4 54 8.87	2.5597	N.21 24 0.4	0.832	0	6 53 19.05	2.3732	N.19 25 11.5	5.474
1	4 56 42.41	2.5581	21 24 45.9	0.685	1	6 55 41.27	2.3676	19 19 39.8	5.582
2	4 59 15.84	2.5563	21 25 22.6	0.539	2	6 58 3.16	2.3620	19 14 1.6	5.690
3	5 1 49.17	2.5545	21 25 50.6	0.393	3	7 0 24.71	2.3563	19 8 17.0	5.796
4	5 4 22.38	2.5525	21 26 9.8	0.248	4	7 2 45.92	2.3507	19 2 26.1	5.900
5	5 6 55.47	2.5504	21 26 20.4	+ 0.103	5	7 5 6.79	2.3449	18 56 29.0	6.003
6	5 9 28.43	2.5482	21 26 22.2	− 0.042	6	7 7 27.31	2.3392	18 50 25.7	6.106
7	5 12 1.26	2.5460	21 26 15.4	0.186	7	7 9 47.49	2.3334	18 44 16.3	6.207
8	5 14 33.95	2.5436	21 25 59.9	0.330	8	7 12 7.32	2.3277	18 38 0.8	6.307
9	5 17 6.49	2.5410	21 25 35.8	0.473	9	7 14 26.81	2.3219	18 31 39.4	6.406
10	5 19 38.87	2.5383	21 25 3.1	0.616	10	7 16 45.95	2.3160	18 25 12.1	6.503
11	5 22 11.09	2.5357	21 24 21.9	0.758	11	7 19 4.73	2.3102	18 18 39.0	6.600
12	5 24 43.15	2.5329	21 23 32.1	0.901	12	7 21 23.17	2.3044	18 12 0.1	6.695
13	5 27 15.04	2.5299	21 22 33.8	1.042	13	7 23 41.26	2.2985	18 5 15.6	6.788
14	5 29 46.74	2.5268	21 21 27.1	1.182	14	7 25 58.99	2.2926	17 58 25.5	6.882
15	5 32 18.26	2.5237	21 20 11.9	1.323	15	7 28 16.37	2.2867	17 51 29.8	6.973
16	5 34 49.58	2.5204	21 18 48.3	1.462	16	7 30 33.40	2.2808	17 44 28.7	7.063
17	5 37 20.71	2.5171	21 17 16.4	1.602	17	7 32 50.07	2.2749	17 37 22.2	7.152
18	5 39 51.63	2.5136	21 15 36.1	1.740	18	7 35 6.39	2.2691	17 30 10.4	7.241
19	5 42 22.34	2.5101	21 13 47.6	1.877	19	7 37 22.36	2.2632	17 22 53.3	7.327
20	5 44 52.84	2.5064	21 11 50.8	2.014	20	7 39 37.97	2.2572	17 15 31.1	7.412
21	5 47 23.11	2.5027	21 9 45.9	2.150	21	7 41 53.23	2.2513	17 8 3.8	7.497
22	5 49 53.16	2.4989	21 7 32.8	2.286	22	7 44 8.13	2.2454	17 0 31.4	7.581
23	5 52 22.98	2.4949	21 5 11.6	2.420	23	7 46 22.68	2.2396	16 52 54.1	7.663
24	5 54 52.55	2.4908	N.21 2 42.4	2.553	24	7 48 36.88	2.2337	N.16 45 11.9	7.743

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	SUNDAY 9.					**TUESDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 48 36.88	2.2337	N.16 45 11.9	7.743	0	9 29 31.40	1.9856	N. 9 21 54.8	10.327
1	7 50 50.73	2.2278	16 37 24.9	7.822	1	9 31 30.41	1.9815	9 11 34.3	10.357
2	7 53 4.22	2.2219	16 29 33.2	7.901	2	9 33 29.18	1.9775	9 1 12.0	10.386
3	7 55 17.36	2.2161	16 21 36.8	7.977	3	9 35 27.71	1.9735	8 50 48.0	10.414
4	7 57 30.15	2.2102	16 13 35.8	8.053	4	9 37 26.00	1.9696	8 40 22.3	10.442
5	7 59 42.59	2.2044	16 5 30.3	8.129	5	9 39 24.06	1.9657	8 29 55.0	10.467
6	8 1 54.68	2.1986	15 57 20.3	8.202	6	9 41 21.89	1.9620	8 19 26.2	10.493
7	8 4 6.42	2.1928	15 49 6.0	8.275	7	9 43 19.50	1.9583	8 8 55.8	10.518
8	8 6 17.82	2.1871	15 40 47.3	8.347	8	9 45 16.88	1.9546	7 58 24.0	10.543
9	8 8 28.87	2.1813	15 32 24.4	8.417	9	9 47 14.05	1.9510	7 47 50.7	10.567
10	8 10 39.58	2.1756	15 23 57.3	8.486	10	9 49 11.00	1.9474	7 37 16.0	10.589
11	8 12 49.94	2.1698	15 15 26.1	8.553	11	9 51 7.74	1.9440	7 26 40.0	10.610
12	8 14 59.96	2.1642	15 6 50.9	8.620	12	9 53 4.28	1.9406	7 16 2.8	10.631
13	8 17 9.64	2.1585	14 58 11.7	8.686	13	9 55 0.61	1.9372	7 5 24.3	10.652
14	8 19 18.98	2.1529	14 49 28.6	8.750	14	9 56 56.74	1.9338	6 54 44.6	10.671
15	8 21 27.99	2.1474	14 40 41.7	8.813	15	9 58 52.67	1.9306	6 44 3.8	10.689
16	8 23 36.67	2.1418	14 31 51.0	8.876	16	10 0 48.41	1.9274	6 33 21.9	10.707
17	8 25 45.01	2.1362	14 22 56.6	8.937	17	10 2 43.96	1.9242	6 22 39.0	10.724
18	8 27 53.02	2.1307	14 13 58.5	8.997	18	10 4 39.32	1.9212	6 11 55.0	10.741
19	8 30 0.70	2.1252	14 4 56.9	9.056	19	10 6 34.50	1.9182	6 1 10.1	10.757
20	8 32 8.05	2.1198	13 55 51.8	9.114	20	10 8 29.50	1.9152	5 50 24.2	10.772
21	8 34 15.08	2.1145	13 46 43.2	9.172	21	10 10 24.33	1.9123	5 39 37.4	10.787
22	8 36 21.79	2.1092	13 37 31.2	9.227	22	10 12 18.98	1.9094	5 28 49.8	10.800
23	8 38 28.18	2.1038	N.13 28 15.9	9.282	23	10 14 13.46	1.9067	N. 5 18 1.4	10.813
	MONDAY 10.					**WEDNESDAY 12.**			
0	8 40 34.25	2.0986	N.13 18 57.4	9.335	0	10 16 7.78	1.9040	N. 5 7 12.2	10.826
1	8 42 40.01	2.0933	13 9 35.7	9.387	1	10 18 1.94	1.9013	4 56 22.3	10.837
2	8 44 45.45	2.0881	13 0 10.9	9.439	2	10 19 55.94	1.8987	4 45 31.8	10.847
3	8 46 50.58	2.0829	12 50 43.0	9.490	3	10 21 49.79	1.8962	4 34 40.6	10.858
4	8 48 55.40	2.0778	12 41 12.1	9.539	4	10 23 43.49	1.8937	4 23 48.8	10.867
5	8 50 59.92	2.0727	12 31 38.3	9.587	5	10 25 37.04	1.8913	4 12 56.5	10.877
6	8 53 4.13	2.0677	12 22 1.6	9.635	6	10 27 30.45	1.8890	4 2 3.6	10.885
7	8 55 8.04	2.0627	12 12 22.1	9.682	7	10 29 23.72	1.8867	3 51 10.3	10.892
8	8 57 11.66	2.0578	12 2 39.8	9.727	8	10 31 16.85	1.8844	3 40 16.5	10.899
9	8 59 14.98	2.0529	11 52 54.8	9.772	9	10 33 9.85	1.8823	3 29 22.4	10.905
10	9 1 18.01	2.0481	11 43 7.2	9.815	10	10 35 2.73	1.8802	3 18 27.9	10.911
11	9 3 20.75	2.0433	11 33 17.0	9.857	11	10 36 55.48	1.8782	3 7 33.1	10.916
12	9 5 23.20	2.0385	11 23 24.3	9.899	12	10 38 48.11	1.8762	2 56 38.0	10.920
13	9 7 25.37	2.0338	11 13 29.1	9.940	13	10 40 40.63	1.8743	2 45 42.7	10.924
14	9 9 27.26	2.0292	11 3 31.5	9.980	14	10 42 33.03	1.8724	2 34 47.1	10.927
15	9 11 28.87	2.0246	10 53 31.5	10.019	15	10 44 25.32	1.8707	2 23 51.4	10.929
16	9 13 30.21	2.0200	10 43 29.2	10.057	16	10 46 17.51	1.8689	2 12 55.6	10.931
17	9 15 31.27	2.0155	10 33 24.7	10.093	17	10 48 9.59	1.8672	2 1 59.7	10.932
18	9 17 32.07	2.0111	10 23 17.9	10.129	18	10 50 1.58	1.8657	1 51 3.7	10.933
19	9 19 32.60	2.0067	10 13 9.1	10.164	19	10 51 53.47	1.8641	1 40 7.6	10.933
20	9 21 32.87	2.0023	10 2 58.2	10.199	20	10 53 45.27	1.8627	1 29 11.6	10.932
21	9 23 32.88	1.9981	9 52 45.2	10.232	21	10 55 36.99	1.8612	1 18 15.7	10.931
22	9 25 32.64	1.9938	9 42 30.3	10.264	22	10 57 28.62	1.8598	1 7 19.9	10.929
23	9 27 32.14	1.9897	9 32 13.5	10.296	23	10 59 20.17	1.8585	0 56 24.2	10.927
24	9 29 31.40	1.9856	N. 9 21 54.8	10.327	24	11 1 11.64	1.8572	N. 0 45 28.6	10.925

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	THURSDAY 13.					SATURDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 1 11.64	1.8572	N. 0 45 28.6	10.925	0	12 30 3.13	1.8674	S. 7 44 48.7	10.123
1	11 3 3.04	1.8561	0 34 33.2	10.921	1	12 31 55.22	1.8690	7 54 55.2	10.093
2	11 4 54.37	1.8550	0 23 38.1	10.917	2	12 33 47.41	1.8706	8 4 59.9	10.062
3	11 6 45.64	1.8540	0 12 43.2	10.912	3	12 35 39.69	1.8722	8 15 2.7	10.031
4	11 8 36.85	1.8530	N. 0 1 48.6	10.907	4	12 37 32.08	1.8740	8 25 3.6	9.999
5	11 10 28.00	1.8520	S. 0 9 5.6	10.901	5	12 39 24.57	1.8758	8 35 2.6	9.967
6	11 12 19.09	1.8511	0 19 59.5	10.895	6	12 41 17.17	1.8777	8 44 59.6	9.933
7	11 14 10.13	1.8503	0 30 53.0	10.887	7	12 43 9.89	1.8796	8 54 54.6	9.899
8	11 16 1.13	1.8497	0 41 46.0	10.880	8	12 45 2.72	1.8815	9 4 47.5	9.865
9	11 17 52.09	1.8489	0 52 38.6	10.872	9	12 46 55.67	1.8835	9 14 38.4	9.830
10	11 19 43.00	1.8482	1 3 30.7	10.864	10	12 48 48.74	1.8856	9 24 27.1	9.794
11	11 21 33.88	1.8477	1 14 22.3	10.854	11	12 50 41.94	1.8877	9 34 13.7	9.758
12	11 23 24.72	1.8472	1 25 13.2	10.844	12	12 52 35.26	1.8898	9 43 58.1	9.721
13	11 25 15.54	1.8467	1 36 3.6	10.835	13	12 54 28.72	1.8921	9 53 40.2	9.683
14	11 27 6.33	1.8463	1 46 53.4	10.823	14	12 56 22.31	1.8943	10 3 20.1	9.646
15	11 28 57.10	1.8460	1 57 42.4	10.812	15	12 58 16.03	1.8965	10 12 57.7	9.607
16	11 30 47.85	1.8457	2 8 30.8	10.800	16	13 0 9.89	1.8988	10 22 32.9	9.567
17	11 32 38.58	1.8455	2 19 18.4	10.787	17	13 2 3.89	1.9012	10 32 5.8	9.528
18	11 34 29.31	1.8454	2 30 5.3	10.775	18	13 3 58.04	1.9037	10 41 36.3	9.487
19	11 36 20.03	1.8452	2 40 51.4	10.761	19	13 5 52.33	1.9061	10 51 4.3	9.446
20	11 38 10.74	1.8452	2 51 36.6	10.747	20	13 7 46.77	1.9087	11 0 29.8	9.404
21	11 40 1.45	1.8452	3 2 21.0	10.732	21	13 9 41.37	1.9113	11 9 52.9	9.362
22	11 41 52.17	1.8453	3 13 4.4	10.716	22	13 11 36.13	1.9139	11 19 13.4	9.319
23	11 43 42.89	1.8454	S. 3 23 46.9	10.701	23	13 13 31.04	1.9164	S. 11 28 31.2	9.275
	FRIDAY 14.					SUNDAY 16.			
0	11 45 33.62	1.8457	S. 3 34 28.5	10.685	0	13 15 26.10	1.9191	S. 11 37 46.4	9.231
1	11 47 24.37	1.8459	3 45 9.1	10.668	1	13 17 21.33	1.9219	11 46 58.9	9.186
2	11 49 15.13	1.8462	3 55 48.6	10.650	2	13 19 16.73	1.9247	11 56 8.7	9.141
3	11 51 5.92	1.8467	4 6 27.1	10.632	3	13 21 12.30	1.9276	12 5 15.8	9.095
4	11 52 56.73	1.8470	4 17 4.4	10.613	4	13 23 8.04	1.9305	12 14 20.1	9.047
5	11 54 47.56	1.8475	4 27 40.6	10.594	5	13 25 3.96	1.9334	12 23 21.5	8.999
6	11 56 38.43	1.8481	4 38 15.7	10.575	6	13 27 0.05	1.9363	12 32 20.0	8.951
7	11 58 29.33	1.8487	4 48 49.6	10.554	7	13 28 56.31	1.9392	12 41 15.6	8.902
8	12 0 20.27	1.8493	4 59 22.2	10.532	8	13 30 52.76	1.9423	12 50 8.3	8.853
9	12 2 11.25	1.8500	5 9 53.5	10.511	9	13 32 49.39	1.9453	12 58 58.0	8.803
10	12 4 2.27	1.8507	5 20 23.5	10.489	10	13 34 46.20	1.9484	13 7 44.7	8.752
11	12 5 53.34	1.8516	5 30 52.2	10.467	11	13 36 43.20	1.9516	13 16 28.3	8.700
12	12 7 44.46	1.8525	5 41 19.5	10.443	12	13 38 40.39	1.9548	13 25 8.7	8.647
13	12 9 35.64	1.8534	5 51 45.4	10.420	13	13 40 37.77	1.9580	13 33 46.0	8.595
14	12 11 26.87	1.8544	6 2 9.9	10.397	14	13 42 35.35	1.9613	13 42 20.1	8.542
15	12 13 18.17	1.8555	6 12 33.0	10.372	15	13 44 33.13	1.9646	13 50 51.0	8.487
16	12 15 9.53	1.8566	6 22 54.5	10.346	16	13 46 31.10	1.9678	13 59 18.6	8.432
17	12 17 0.96	1.8577	6 33 14.5	10.320	17	13 48 29.27	1.9712	14 7 42.9	8.377
18	12 18 52.46	1.8589	6 43 32.9	10.293	18	13 50 27.64	1.9746	14 16 3.8	8.320
19	12 20 44.03	1.8602	6 53 49.7	10.267	19	13 52 26.22	1.9780	14 24 21.3	8.263
20	12 22 35.68	1.8615	7 4 4.9	10.240	20	13 54 25.00	1.9815	14 32 35.4	8.206
21	12 24 27.41	1.8629	7 14 18.5	10.212	21	13 56 24.00	1.9850	14 40 46.0	8.147
22	12 26 19.23	1.8643	7 24 30.3	10.183	22	13 58 23.20	1.9884	14 48 53.0	8.087
23	12 28 11.13	1.8658	7 34 40.4	10.153	23	14 0 22.61	1.9919	14 56 56.5	8.027
24	12 30 3.13	1.8674	S. 7 44 48.7	10.123	24	14 2 22.23	1.9955	S. 15 4 56.3	7.967

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	MONDAY 17.					**WEDNESDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 2 22.23	1.9955	S.15 4 56.3	7.967	0	15 42 35.04	2.1814	S.20 3 23.9	4.179
1	14 4 22.07	1.9992	15 12 52.5	7.906	1	15 44 46.04	2.1852	20 7 31.8	4.083
2	14 6 22.13	2.0028	15 20 45.0	7.844	2	15 46 57.26	2.1889	20 11 33.9	3.986
3	14 8 22.41	2.0064	15 28 33.8	7.781	3	15 49 8.71	2.1927	20 15 30.1	3.887
4	14 10 22.90	2.0101	15 36 18.7	7.717	4	15 51 20.38	2.1963	20 19 20.3	3.787
5	14 12 23.62	2.0138	15 43 59.8	7.653	5	15 53 32.26	2.1998	20 23 4.6	3.688
6	14 14 24.56	2.0175	15 51 37.1	7.588	6	15 55 44.36	2.2035	20 26 42.9	3.588
7	14 16 25.72	2.0212	15 59 10.4	7.523	7	15 57 56.68	2.2071	20 30 15.2	3.487
8	14 18 27.11	2.0250	16 6 39.8	7.457	8	16 0 9.21	2.2105	20 33 41.4	3.385
9	14 20 28.72	2.0287	16 14 5.2	7.389	9	16 2 21.94	2.2140	20 37 1.4	3.283
10	14 22 30.56	2.0326	16 21 26.5	7.321	10	16 4 34.89	2.2175	20 40 15.4	3.180
11	14 24 32.63	2.0364	16 28 43.7	7.252	11	16 6 48.04	2.2209	20 43 23.1	3.076
12	14 26 34.93	2.0402	16 35 56.7	7.182	12	16 9 1.40	2.2243	20 46 24.5	2.972
13	14 28 37.46	2.0441	16 43 5.6	7.112	13	16 11 14.96	2.2277	20 49 19.7	2.867
14	14 30 40.22	2.0480	16 50 10.2	7.041	14	16 13 28.72	2.2310	20 52 8.5	2.761
15	14 32 43.22	2.0519	16 57 10.5	6.969	15	16 15 42.68	2.2342	20 54 51.0	2.655
16	14 34 46.45	2.0558	17 4 6.5	6.897	16	16 17 56.83	2.2375	20 57 27.1	2.548
17	14 36 49.91	2.0597	17 10 58.2	6.824	17	16 20 11.18	2.2407	20 59 56.8	2.441
18	14 38 53.61	2.0637	17 17 45.4	6.750	18	16 22 25.71	2.2437	21 2 20.0	2.333
19	14 40 57.55	2.0676	17 24 28.2	6.675	19	16 24 40.43	2.2469	21 4 36.7	2.224
20	14 43 1.72	2.0715	17 31 6.4	6.599	20	16 26 55.34	2.2500	21 6 46.9	2.116
21	14 45 6.13	2.0755	17 37 40.2	6.523	21	16 29 10.43	2.2529	21 8 50.6	2.007
22	14 47 10.78	2.0794	17 44 9.3	6.447	22	16 31 25.69	2.2558	21 10 47.7	1.896
23	14 49 15.66	2.0834	S.17 50 33.8	6.369	23	16 33 41.13	2.2587	S.21 12 38.1	1.785
	TUESDAY 18.					**THURSDAY 20.**			
0	14 51 20.79	2.0874	S.17 56 53.6	6.290	0	16 35 56.74	2.2616	S.21 14 21.9	1.674
1	14 53 26.15	2.0914	18 3 8.6	6.211	1	16 38 12.52	2.2644	21 15 59.0	1.563
2	14 55 31.76	2.0954	18 9 18.9	6.131	2	16 40 28.47	2.2672	21 17 29.4	1.451
3	14 57 37.60	2.0993	18 15 24.3	6.050	3	16 42 44.58	2.2698	21 18 53.1	1.338
4	14 59 43.68	2.1033	18 21 24.9	5.969	4	16 45 0.85	2.2725	21 20 10.0	1.225
5	15 1 50.00	2.1072	18 27 20.6	5.887	5	16 47 17.28	2.2750	21 21 20.1	1.112
6	15 3 56.55	2.1112	18 33 11.3	5.803	6	16 49 33.85	2.2775	21 22 23.4	0.998
7	15 6 3.35	2.1153	18 38 57.0	5.719	7	16 51 50.58	2.2801	21 23 19.8	0.883
8	15 8 10.39	2.1192	18 44 37.6	5.634	8	16 54 7.46	2.2825	21 24 9.4	0.769
9	15 10 17.66	2.1232	18 50 13.1	5.549	9	16 56 24.48	2.2848	21 24 52.1	0.653
10	15 12 25.18	2.1272	18 55 43.5	5.463	10	16 58 41.64	2.2871	21 25 27.8	0.537
11	15 14 32.93	2.1311	19 1 8.7	5.377	11	17 0 58.93	2.2892	21 25 56.6	0.422
12	15 16 40.91	2.1351	19 6 28.7	5.289	12	17 3 16.35	2.2914	21 26 18.5	0.307
13	15 18 49.14	2.1391	19 11 43.4	5.201	13	17 5 33.90	2.2936	21 26 33.4	0.189
14	15 20 57.60	2.1430	19 16 52.8	5.112	14	17 7 51.58	2.2957	21 26 41.2	− 0.072
15	15 23 6.30	2.1469	19 21 56.8	5.022	15	17 10 9.38	2.2977	21 26 42.0	+ 0.045
16	15 25 15.23	2.1508	19 26 55.4	4.931	16	17 12 27.30	2.2996	21 26 35.8	0.163
17	15 27 24.40	2.1547	19 31 48.5	4.839	17	17 14 45.33	2.3014	21 26 22.5	0.281
18	15 29 33.80	2.1586	19 36 36.1	4.747	18	17 17 3.47	2.3032	21 26 2.1	0.398
19	15 31 43.43	2.1625	19 41 18.2	4.655	19	17 19 21.71	2.3049	21 25 34.7	0.517
20	15 33 53.30	2.1663	19 45 54.7	4.562	20	17 21 40.06	2.3067	21 25 0.1	0.636
21	15 36 3.39	2.1702	19 50 25.6	4.467	21	17 23 58.51	2.3083	21 24 18.4	0.754
22	15 38 13.72	2.1740	19 54 50.8	4.372	22	17 26 17.05	2.3097	21 23 29.6	0.873
23	15 40 24.27	2.1777	19 59 10.3	4.276	23	17 28 35.68	2.3112	21 22 33.6	0.992
24	15 42 35.04	2.1814	S.20 3 23.9	4.179	24	17 30 54.40	2.3127	S.21 21 30.5	1.112

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	FRIDAY 21.					SUNDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 30 54.40	2.3127	S.21 21 30.5	1.112	0	19 22 17.69	2.3057	S.18 11 27.0	6.710
1	17 33 13.20	2.3140	21 20 20.2	1.232	1	19 24 35.99	2.3042	18 4 41.2	6.817
2	17 35 32.08	2.3152	21 19 2.7	1.351	2	19 26 54.20	2.3028	17 57 48.9	6.924
3	17 37 51.03	2.3164	21 17 38.1	1.471	3	19 29 12.33	2.3013	17 50 50.3	7.030
4	17 40 10.05	2.3176	21 16 6.2	1.591	4	19 31 30.36	2.2997	17 43 45.3	7.135
5	17 42 29.14	2.3187	21 14 27.2	1.710	5	19 33 48.30	2.2982	17 36 34.1	7.239
6	17 44 48.29	2.3197	21 12 41.0	1.830	6	19 36 6.14	2.2965	17 29 16.6	7.343
7	17 47 7.50	2.3206	21 10 47.6	1.951	7	19 38 23.88	2.2948	17 21 52.9	7.446
8	17 49 26.76	2.3214	21 8 46.9	2.071	8	19 40 41.52	2.2932	17 14 23.1	7.548
9	17 51 46.07	2.3222	21 6 39.1	2.191	9	19 42 59.06	2.2915	17 6 47.1	7.650
10	17 54 5.43	2.3230	21 4 24.0	2.312	10	19 45 16.50	2.2897	16 59 5.1	7.751
11	17 56 24.83	2.3237	21 2 1.7	2.432	11	19 47 33.83	2.2880	16 51 17.0	7.851
12	17 58 44.27	2.3242	20 59 32.2	2.552	12	19 49 51.06	2.2862	16 43 23.0	7.949
13	18 1 3.74	2.3247	20 56 55.5	2.672	13	19 52 8.18	2.2844	16 35 23.1	8.048
14	18 3 23.24	2.3252	20 54 11.6	2.792	14	19 54 25.19	2.2826	16 27 17.2	8.147
15	18 5 42.77	2.3257	20 51 20.5	2.912	15	19 56 42.09	2.2807	16 19 5.4	8.243
16	18 8 2.32	2.3260	20 48 22.2	3.032	16	19 58 58.88	2.2789	16 10 48.0	8.338
17	18 10 21.89	2.3262	20 45 16.7	3.151	17	20 1 15.56	2.2771	16 2 24.8	8.434
18	18 12 41.47	2.3264	20 42 4.1	3.270	18	20 3 32.13	2.2752	15 53 55.9	8.528
19	18 15 1.06	2.3266	20 38 44.3	3.390	19	20 5 48.58	2.2732	15 45 21.4	8.622
20	18 17 20.66	2.3267	20 35 17.3	3.509	20	20 8 4.91	2.2712	15 36 41.3	8.714
21	18 19 40.27	2.3267	20 31 43.2	3.628	21	20 10 21.13	2.2693	15 27 55.7	8.806
22	18 21 59.87	2.3267	20 28 2.0	3.747	22	20 12 37.23	2.2674	15 19 4.6	8.897
23	18 24 19.47	2.3265	S.20 24 13.6	3.866	23	20 14 53.22	2.2655	S.15 10 8.1	8.987
	SATURDAY 22.					MONDAY 24.			
0	18 26 39.05	2.3263	S.20 20 18.1	3.984	0	20 17 9.09	2.2635	S.15 1 6.1	9.077
1	18 28 58.63	2.3262	20 16 15.5	4.102	1	20 19 24.84	2.2615	14 51 58.8	9.165
2	18 31 18.19	2.3258	20 12 5.8	4.220	2	20 21 40.47	2.2596	14 42 46.3	9.252
3	18 33 37.73	2.3255	20 7 49.1	4.337	3	20 23 55.99	2.2576	14 33 28.6	9.338
4	18 35 57.25	2.3251	20 3 25.3	4.455	4	20 26 11.38	2.2555	14 24 5.7	9.423
5	18 38 16.74	2.3246	19 58 54.5	4.572	5	20 28 26.65	2.2536	14 14 37.8	9.508
6	18 40 36.20	2.3241	19 54 16.7	4.688	6	20 30 41.81	2.2517	14 5 4.8	9.592
7	18 42 55.63	2.3235	19 49 31.9	4.804	7	20 32 56.85	2.2497	13 55 26.8	9.674
8	18 45 15.02	2.3228	19 44 40.2	4.920	8	20 35 11.77	2.2477	13 45 43.9	9.756
9	18 47 34.37	2.3221	19 39 41.5	5.035	9	20 37 26.57	2.2457	13 35 56.1	9.837
10	18 49 53.67	2.3213	19 34 36.0	5.150	10	20 39 41.25	2.2437	13 26 3.5	9.916
11	18 52 12.93	2.3206	19 29 23.5	5.265	11	20 41 55.82	2.2417	13 16 6.2	9.994
12	18 54 32.14	2.3197	19 24 4.2	5.379	12	20 44 10.26	2.2397	13 6 4.2	10.072
13	18 56 51.30	2.3188	19 18 38.0	5.493	13	20 46 24.59	2.2378	12 55 57.5	10.149
14	18 59 10.40	2.3178	19 13 5.0	5.607	14	20 48 38.80	2.2359	12 45 46.3	10.225
15	19 1 29.44	2.3168	19 7 25.2	5.720	15	20 50 52.90	2.2340	12 35 30.5	10.300
16	19 3 48.42	2.3157	19 1 38.6	5.832	16	20 53 6.88	2.2321	12 25 10.3	10.373
17	19 6 7.33	2.3147	18 55 45.3	5.944	17	20 55 20.75	2.2302	12 14 45.8	10.445
18	19 8 26.18	2.3136	18 49 45.3	6.055	18	20 57 34.50	2.2283	12 4 16.9	10.517
19	19 10 44.96	2.3123	18 43 38.7	6.165	19	20 59 48.14	2.2264	11 53 43.7	10.588
20	19 13 3.66	2.3110	18 37 25.5	6.275	20	21 2 1.67	2.2245	11 43 6.3	10.658
21	19 15 22.28	2.3097	18 31 5.7	6.385	21	21 4 15.08	2.2227	11 32 24.7	10.727
22	19 17 40.83	2.3085	18 24 39.3	6.494	22	21 6 28.39	2.2209	11 21 39.1	10.793
23	19 19 59.30	2.3072	18 18 6.4	6.602	23	21 8 41.59	2.2190	11 10 49.5	10.860
24	19 22 17.69	2.3057	S.18 11 27.0	6.710	24	21 10 54.67	2.2172	S.10 59 55.9	10.926

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute
	TUESDAY 25.					THURSDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 10 54.67	2.2172	S. 10 59 55.9	10.926	0	22 55 54.48	2.1737	S. 1 21 6.3	12.757
1	21 13 7.65	2.2155	10 48 58.4	10.990	1	22 58 4.91	2.1739	1 8 20.5	12.767
2	21 15 20.53	2.2138	10 37 57.1	11.053	2	23 0 15.35	2.1742	0 55 34.2	12.776
3	21 17 33.31	2.2121	10 26 51.9	11.115	3	23 2 25.81	2.1746	0 42 47.4	12 784
4	21 19 45.98	2.2103	10 15 43.2	11.176	4	23 4 36.30	2.1750	0 30 0.1	12.791
5	21 21 58.55	2.2087	10 4 30.8	11.237	5	23 6 46.81	2.1754	0 17 12.5	12.796
6	21 24 11.02	2.2071	9 53 14.8	11.296	6	23 8 57.35	2.1759	S. 0 4 24.6	12.800
7	21 26 23.40	2.2055	9 41 55.3	11.353	7	23 11 7.92	2.1765	N. 0 8 23.5	12.803
8	21 28 35.68	2.2039	9 30 32.4	11.410	8	23 13 18.53	2.1772	0 21 11.8	12.805
9	21 30 47.87	2.2024	9 19 6.1	11.466	9	23 15 29.18	2.1778	0 34 0.1	12.805
10	21 32 59.97	2.2009	9 7 36.5	11.520	10	23 17 39.87	2.1785	0 46 48.4	12.805
11	21 35 11.98	2.1993	8 56 3.7	11.573	11	23 19 50.60	2.1792	0 59 36.7	12.803
12	21 37 23.89	2.1978	8 44 27.7	11.626	12	23 22 1.38	2.1801	1 12 24.8	12.800
13	21 39 35.72	2.1965	8 32 48.6	11.677	13	23 24 12.21	2.1810	1 25 12.7	12.796
14	21 41 47.47	2.1951	8 21 6.4	11.727	14	23 26 23.10	2.1820	1 38 0.3	12 791
15	21 43 59.13	2.1937	8 9 21.3	11.776	15	23 28 34.05	2.1830	1 50 47.6	12.784
16	21 46 10.72	2.1925	7 57 33.3	11.824	16	23 30 45.06	2.1841	2 3 34.4	12.776
17	21 48 22.23	2.1912	7 45 42.4	11.871	17	23 32 56.14	2.1852	2 16 20.7	12.767
18	21 50 33.66	2.1899	7 33 48.8	11.917	18	23 35 7.28	2.1863	2 29 6.5	12.757
19	21 52 45.02	2.1887	7 21 52.4	11.962	19	23 37 18.49	2.1875	2 41 51.6	12.746
20	21 54 56.31	2.1876	7 9 53.4	12.005	20	23 39 29.78	2.1888	2 54 36.0	12.733
21	21 57 7.53	2.1865	6 57 51.8	12.047	21	23 41 41.15	2.1902	3 7 19.6	12.720
22	21 59 18.69	2.1854	6 45 47.7	12.088	22	23 43 52.60	2.1916	3 20 2.4	12.705
23	22 1 29.78	2.1843	S. 6 33 41.2	12.128	23	23 46 4.14	2.1931	N. 3 32 44.2	12.688
	WEDNESDAY 26.					FRIDAY 28.			
0	22 3 40.81	2.1833	S. 6 21 32.3	12.167	0	23 48 15.77	2.1946	N. 3 45 25.0	12.671
1	22 5 51.78	2.1824	6 9 21.1	12.205	1	23 50 27.49	2.1961	3 58 4.7	12.652
2	22 8 2.70	2.1815	5 57 7.7	12.242	2	23 52 39.30	2.1976	4 10 43.3	12.633
3	22 10 13.56	2.1806	5 44 52.1	12.277	3	23 54 51.20	2.1993	4 23 20.7	12.612
4	22 12 24.37	2.1798	5 32 34.4	12.312	4	23 57 3.21	2.2011	4 35 56.8	12.590
5	22 14 35.14	2.1791	5 20 14.7	12.345	5	23 59 15.33	2.2028	4 48 31.5	12.567
6	22 16 45.86	2.1783	5 7 53.0	12.377	6	0 1 27.55	2.2046	5 1 4.8	12.542
7	22 18 56.54	2.1777	4 55 29.4	12.408	7	0 3 39.88	2.2064	5 13 36.5	12.516
8	22 21 7.19	2.1771	4 43 4.0	12.437	8	0 5 52.32	2.2083	5 26 6.7	12.489
9	22 23 17.79	2.1764	4 30 36.9	12.466	9	0 8 4.88	2.2103	5 38 35.2	12.460
10	22 25 28.36	2.1759	4 18 8.1	12.493	10	0 10 17.56	2.2123	5 51 1.9	12.431
11	22 27 38.90	2.1754	4 5 37.7	12.520	11	0 12 30.36	2.2145	6 3 26.9	12.400
12	22 29 49.41	2.1750	3 53 5.7	12.546	12	0 14 43.30	2.2167	6 15 49.9	12.368
13	22 31 59.90	2.1746	3 40 32.2	12.570	13	0 16 56.36	2.2188	6 28 11.0	12.335
14	22 34 10.36	2.1742	3 27 57.3	12.592	14	0 19 9.55	2.2210	6 40 30.1	12.300
15	22 36 20.81	2.1740	3 15 21.1	12.614	15	0 21 22.88	2.2232	6 52 47.0	12.264
16	22 38 31.24	2.1737	3 2 43.6	12.635	16	0 23 36.34	2.2256	7 5 1.8	12.227
17	22 40 41.65	2.1735	2 50 4.9	12.654	17	0 25 49.95	2.2280	7 17 14.3	12.188
18	22 42 52.06	2.1734	2 37 25.1	12.672	18	0 28 3.70	2.2304	7 29 24.4	12.149
19	22 45 2.46	2.1733	2 24 44.2	12.690	19	0 30 17.60	2.2328	7 41 32.2	12.109
20	22 47 12.86	2.1733	2 12 2.3	12.706	20	0 32 31.64	2.2353	7 53 37.5	12.067
21	22 49 23.26	2.1733	1 59 19.5	12.720	21	0 34 45.84	2.2380	8 5 40.3	12.024
22	22 51 33.66	2.1734	1 46 35.8	12.733	22	0 37 0.20	2.2406	8 17 40.4	11.979
23	22 53 44.07	2.1735	1 33 51.4	12.746	23	0 39 14.71	2.2432	8 29 37.8	11.933
24	22 55 54.48	2.1737	S. 1 21 6.3	12.757	24	0 41 29.38	2.2458	N. 8 41 32.4	11.887

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 29.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	0 41 29.38	2.2458	N. 8 41 32.4	11.887
1	0 43 44.21	2.2486	8 53 24.2	11.839
2	0 45 59.21	2.2513	9 5 13.1	11.789
3	0 48 14.37	2.2541	9 16 58.9	11.738
4	0 50 29.70	2.2570	9 28 41.7	11.687
5	0 52 45.21	2.2599	9 40 21.4	11.634
6	0 55 0.89	2.2628	9 51 57.8	11.579
7	0 57 16.75	2.2657	10 3 30.9	11.523
8	0 59 32.78	2.2687	10 15 0.6	11.467
9	1 1 49.00	2.2718	10 26 26.9	11.408
10	1 4 5.40	2.2749	10 37 49.6	11.349
11	1 6 21.99	2.2780	10 49 8.8	11.289
12	1 8 38.76	2.2811	11 0 24.4	11.227
13	1 10 55.72	2.2842	11 11 36.1	11.163
14	1 13 12.87	2.2875	11 22 44.0	11.099
15	1 15 30.22	2.2907	11 33 48.0	11.033
16	1 17 47.76	2.2940	11 44 48.0	10.967
17	1 20 5.50	2.2973	11 55 44.0	10.898
18	1 22 23.44	2.3006	12 6 35.8	10.829
19	1 24 41.57	2.3038	12 17 23.5	10.759
20	1 26 59.90	2.3072	12 28 6.9	10.687
21	1 29 18.44	2.3107	12 38 45.9	10.613
22	1 31 37.18	2.3140	12 49 20.5	10.539
23	1 33 56.12	2.3173	N.12 59 50.6	10.463

SUNDAY 30.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	1 36 15.26	2.3207	N.13 10 16.1	10.387
1	1 38 34.61	2.3242	13 20 37.0	10.309
2	1 40 54.17	2.3277	13 30 53.2	10.230
3	1 43 13.94	2.3312	13 41 4.6	10.149
4	1 45 33.92	2.3347	13 51 11.1	10.067
5	1 47 54.10	2.3382	14 1 12.7	9.984
6	1 50 14.50	2.3417	14 11 9.2	9.900
7	1 52 35.11	2.3452	14 21 0.7	9.815
8	1 54 55.92	2.3487	14 30 47.0	9.728
9	1 57 16.95	2.3522	14 40 28.1	9.641
10	1 59 38.19	2.3557	14 50 3.9	9.552
11	2 1 59.64	2.3592	14 59 34.3	9.462
12	2 4 21.30	2.3627	15 8 59.3	9.371
13	2 6 43.17	2.3663	15 18 18.8	9.278
14	2 9 5.26	2 3698	15 27 32.6	9.183
15	2 11 27.55	2.3732	15 36 40.8	9.089
16	2 13 50.05	2.3768	15 45 43.3	8.993
17	2 16 12.77	2.3803	15 54 40.0	8.896
18	2 18 35.69	2.3837	16 3 30.8	8.797
19	2 20 58.82	2.3872	16 12 15.7	8.698
20	2 23 22.16	2.3907	16 20 54.6	8.597
21	2 25 45.70	2.3941	16 29 27.4	8.496
22	2 28 9.45	2.3976	16 37 54.1	8.393
23	2 30 33.41	2.4010	16 46 14.6	8.290
24	2 32 57.57	2.4043	N.16 54 28.9	8.185

MONDAY 31.

Hour.	Right Ascension	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
	h m s	s	° ′ ″	″
0	2 32 57.57	2.4043	N.16 54 28.9	8.185
1	2 35 21.93	2.4077	17 2 36.8	8.078
2	2 37 46.49	2.4110	17 10 38.3	7.972
3	2 40 11.25	2.4143	17 18 33.4	7.863
4	2 42 36.21	2.4176	17 26 21.9	7.753
5	2 45 1.36	2.4208	17 34 3.9	7.643
6	2 47 26.70	2.4240	17 41 39.2	7.532
7	2 49 52.24	2.4272	17 49 7.8	7.420
8	2 52 17.96	2.4302	17 56 29.6	7.307
9	2 54 43.87	2.4334	18 3 44.7	7.193
10	2 57 9.97	2.4365	18 10 52.8	7.077
11	2 59 36.25	2.4394	18 17 54.0	6.961
12	3 2 2.70	2.4423	18 24 48.1	6.843
13	3 4 29.33	2.4453	18 31 35.2	6.726
14	3 6 56.14	2.4482	18 38 15.2	6.607
15	3 9 23.12	2.4511	18 44 48.0	6.487
16	3 11 50.27	2.4538	18 51 13.6	6.366
17	3 14 17.58	2.4565	18 57 31.9	6.244
18	3 16 45.05	2.4592	19 3 42.9	6.122
19	3 19 12.68	2.4618	19 9 46.5	5.998
20	3 21 40.47	2.4644	19 15 42.7	5.874
21	3 24 8.41	2.4668	19 21 31.4	5.749
22	3 26 36.49	2.4692	19 27 12.6	5.623
23	3 29 4.72	2.4716	N.19 32 46.2	5.497

TUESDAY, JANUARY 1, 1901.

Hour.	Right Ascension	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
0	3 31 33.08	2.4738	N.19 38 12.3	5.371

PHASES OF THE MOON.

			d	h	m
○	Full Moon	Dec.	5	22	38.3
☾	Last Quarter		13	10	42.2
●	New Moon		21	12	1.3
☽	First Quarter		28	13	48.0

			d	h
☾	Perigee	Dec.	3	7.8
☾	Apogee		15	1.4
☾	Perigee		30	3.9

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	SUN	W.	113 13 31	2547	114 53 39	2540	116 33 57	2532	118 14 26	2525
	SATURN	W.	87 57 31	2267	89 44 19	2260	91 31 18	2252	93 18 28	2245
	Fomalhaut	W.	38 50 14	3693	40 7 8	3579	41 26 5	3474	42 46 58	3383
	Aldebaran	E.	66 54 26	2249	65 7 11	2242	63 19 46	2235	61 32 11	2229
	Pollux	E.	108 54 58	2315	107 9 20	2306	105 23 29	2297	103 37 25	2289
2	SATURN	W.	102 16 46	2214	104 4 52	2210	105 53 5	2205	107 41 25	2200
	Fomalhaut	W.	49 54 12	3052	51 23 21	3003	52 53 30	2958	54 24 35	2920
	a Pegasi	W.	28 35 44	2827	30 9 37	2755	31 45 4	2694	33 21 52	2641
	Aldebaran	E.	52 32 7	2203	50 43 44	2200	48 55 16	2197	47 6 44	2194
	Pollux	E.	94 44 20	2255	92 57 14	2250	91 10 1	2245	89 22 40	2241
3	Fomalhaut	W.	62 11 6	2772	63 46 11	2750	65 21 44	2732	66 57 42	2716
	a Pegasi	W.	41 40 54	2467	43 22 54	2444	45 5 26	2424	46 48 26	2408
	Aldebaran	E.	38 3 21	2192	36 14 41	2194	34 26 4	2197	32 37 32	2202
	Pollux	E.	80 24 37	2228	78 36 51	2227	76 49 4	2227	75 1 17	2228
	Regulus	E.	117 11 46	2176	115 22 42	2174	113 33 35	2172	111 44 25	2170
	MARS	E.	122 37 14	2314	120 51 35	2310	119 5 50	2307	117 20 0	2304
4	Fomalhaut	W.	75 2 5	2662	76 39 36	2657	78 17 13	2653	79 54 56	2651
	a Pegasi	W.	55 28 28	2353	57 13 10	2348	58 58 0	2344	60 42 56	2340
	Pollux	E.	66 2 58	2243	64 15 34	2247	62 28 17	2254	60 41 10	2261
	Regulus	E.	102 38 19	2172	100 49 9	2174	99 0 3	2177	97 11 1	2180
	MARS	E.	108 30 19	2302	106 44 23	2303	104 58 28	2305	103 12 36	2309
5	a Pegasi	W.	69 28 11	2342	71 13 9	2346	72 58 2	2350	74 42 49	2355
	a Arietis	W.	25 51 43	2381	27 35 45	2368	29 20 6	2357	31 4 42	2349
	Pollux	E.	51 48 40	2312	50 2 58	2326	48 17 37	2341	46 32 37	2358
	Regulus	E.	88 7 22	2206	86 19 3	2212	84 30 54	2220	82 42 56	2228
	MARS	E.	94 24 43	2333	92 39 31	2339	90 54 29	2346	89 9 37	2355
6	a Arietis	W.	39 49 24	2346	41 34 17	2350	43 19 3	2356	45 3 41	2363
	Regulus	E.	73 46 26	2277	71 59 53	2288	70 13 36	2300	68 27 37	2313
	MARS	E.	80 28 29	2403	78 44 59	2415	77 1 46	2426	75 18 49	2439
	Spica	E.	127 40 15	2255	125 53 9	2266	124 6 19	2277	122 19 45	2289
7	a Arietis	W.	53 43 54	2411	55 27 13	2423	57 10 15	2435	58 53 0	2448
	Regulus	E.	59 42 26	2382	57 58 25	2397	56 14 46	2412	54 31 29	2429
	MARS	E.	66 48 47	2510	65 7 48	2525	63 27 10	2541	61 46 55	2558
	Spica	E.	113 31 29	2353	111 46 47	2368	110 2 26	2382	108 18 25	2396
	VENUS	E.	131 43 27	2769	130 8 19	2784	128 33 30	2799	126 59 1	2814
8	a Arietis	W.	67 22 6	2517	69 2 55	2534	70 43 21	2550	72 23 25	2565
	Aldebaran	W.	34 7 8	2520	35 47 53	2533	37 28 21	2546	39 8 30	2559
	Regulus	E.	46 1 3	2517	44 20 13	2535	42 39 48	2553	40 59 49	2574
	MARS	E.	53 31 32	2648	51 53 42	2667	50 16 18	2687	48 39 20	2707
	Spica	E.	99 43 44	2474	98 1 54	2489	96 20 26	2506	94 39 21	2522
	VENUS	E.	119 11 41	2896	117 39 17	2913	116 7 15	2930	114 35 35	2947
9	Aldebaran	W.	47 24 29	2632	49 2 40	2647	50 40 31	2663	52 18 1	2679
	Regulus	E.	32 47 2	2683	31 9 59	2707	29 33 29	2732	27 57 32	2759
	MARS	E.	40 41 28	2817	39 7 22	2841	37 33 47	2865	36 0 43	2891

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
1	Sun	W.	119 55 5	2517	121 35 54	2510	123 16 53	2504	124 58 1	2497
	Saturn	W.	95 5 49	2238	96 53 20	2232	98 40 59	2226	100 28 48	2220
	Fomalhaut	W.	44 9 34	3303	45 33 42	3230	46 59 16	3164	48 26 8	3105
	Aldebaran	E.	59 44 27	2223	57 56 34	2217	56 8 32	2212	54 20 23	2208
	Pollux	E.	101 51 10	2281	100 4 43	2274	98 18 5	2267	96 31 17	2261
2	Saturn	W.	109 29 52	2197	111 18 24	2194	113 7 1	2191	114 55 43	2188
	Fomalhaut	W.	55 56 29	2883	57 29 9	2851	59 2 31	2821	60 36 31	2795
	α Pegasi	W.	34 59 51	2596	36 38 52	2556	38 18 48	2522	39 59 31	2493
	Aldebaran	E.	45 18 7	2192	43 29 27	2190	41 40 46	2190	39 52 3	2190
	Pollux	E.	87 35 13	2237	85 47 40	2234	84 0 3	2231	82 12 22	2229
3	Fomalhaut	W.	68 34 1	2701	70 10 39	2689	71 47 34	2678	73 24 44	2669
	α Pegasi	W.	48 31 50	2393	50 15 35	2380	51 59 38	2369	53 43 57	2361
	Aldebaran	E.	30 49 7	2209	29 0 53	2217	27 12 51	2227	25 25 3	2237
	Pollux	E.	73 13 31	2229	71 25 47	2231	69 38 6	2234	67 50 29	2238
	Regulus	E.	109 55 12	2170	108 5 59	2169	106 16 45	2169	104 27 31	2170
	Mars	E.	115 34 7	2303	113 48 12	2302	112 2 15	2301	110 16 17	2301
4	Fomalhaut	W.	81 32 42	2649	83 10 30	2650	84 48 17	2654	86 25 59	2660
	α Pegasi	W.	62 27 57	2339	64 13 0	2337	65 58 5	2338	67 43 9	2339
	Pollux	E.	58 54 13	2269	57 7 28	2279	55 20 57	2289	53 34 40	2300
	Regulus	E.	95 22 3	2184	93 33 11	2189	91 44 27	2194	89 55 50	2200
	Mars	E.	101 26 50	2313	99 41 9	2317	97 55 33	2321	96 10 4	2326
5	α Pegasi	W.	76 27 29	2360	78 12 1	2366	79 56 24	2372	81 40 39	2378
	α Arietis	W.	32 49 30	2344	34 34 26	2340	36 19 27	2341	38 4 27	2343
	Pollux	E.	44 48 2	2377	43 3 54	2396	41 20 14	2418	39 37 5	2443
	Regulus	E.	80 55 11	2237	79 7 39	2246	77 20 20	2256	75 33 15	2266
	Mars	E.	87 24 57	2363	85 40 29	2373	83 56 15	2382	82 12 15	2392
6	α Arietis	W.	46 48 9	2371	48 32 25	2380	50 16 29	2389	52 0 19	2400
	Regulus	E.	66 41 56	2326	64 56 34	2339	63 11 31	2353	61 26 48	2367
	Mars	E.	73 36 10	2453	71 53 50	2466	70 11 49	2480	68 30 8	2494
	Spica	E.	120 33 29	2301	118 47 31	2313	117 1 51	2326	115 16 30	2340
7	α Arietis	W.	60 35 27	2462	62 17 34	2474	63 59 23	2487	65 40 54	2501
	Regulus	E.	52 48 36	2446	51 6 7	2462	49 24 1	2480	47 42 19	2498
	Mars	E.	60 7 2	2575	58 27 33	2593	56 48 28	2611	55 9 47	2629
	Spica	E.	106 34 45	2412	104 51 27	2427	103 8 31	2443	101 25 57	2458
	Venus	E.	125 24 51	2830	123 51 2	2846	122 17 34	2862	120 44 27	2879
8	α Arietis	W.	74 3 8	2580	75 42 30	2596	77 21 31	2612	79 0 10	2627
	Aldebaran	W.	40 48 21	2573	42 27 53	2587	44 7 6	2602	45 45 58	2618
	Regulus	E.	39 20 18	2594	37 41 15	2616	36 2 42	2637	34 24 37	2659
	Mars	E.	47 2 49	2728	45 26 46	2749	43 51 11	2771	42 16 5	2793
	Spica	E.	92 58 39	2539	91 18 20	2556	89 38 24	2572	87 58 51	2588
	Venus	E.	113 4 16	2965	111 33 20	2984	110 2 47	3001	108 32 36	3019
9	Aldebaran	W.	53 55 10	2694	55 31 58	2709	57 8 26	2725	58 44 33	2740
	Regulus	E.	26 22 11	2792	24 47 32	2823	23 13 34	2855	21 40 18	2893
	Mars	E.	34 28 13	2919	32 56 18	2947	31 24 59	2977	29 54 18	3009

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
9	Spica	E.	86 19 40	2605	84 40 52	2622	83 2 27	2638	81 24 24	2655
	Venus	E.	107 2 47	3038	105 33 21	3056	104 4 17	3073	102 35 35	3091
10	Aldebaran	W.	60 20 20	2755	61 55 47	2770	63 30 54	2785	65 5 41	2800
	Pollux	W.	20 39 24	3392	22 1 50	3322	23 25 36	3268	24 50 25	3229
	Mars	E.	28 24 16	3044	26 54 58	3083	25 26 28	3125	23 58 49	3172
	Spica	E.	73 19 43	2736	71 43 51	2752	70 8 20	2767	68 33 9	2783
	Venus	E.	95 17 33	3180	93 51 0	3198	92 24 48	3214	90 58 56	3231
	Sun	E.	128 49 11	3094	127 20 54	3112	125 52 59	3129	124 25 25	3146
11	Aldebaran	W.	72 54 53	2871	74 27 49	2884	76 0 28	2898	77 32 50	2910
	Pollux	W.	32 3 31	3126	33 31 9	3119	34 58 56	3114	36 26 49	3110
	Spica	E.	60 42 11	2855	59 8 55	2869	57 35 57	2883	56 3 16	2895
	Venus	E.	83 54 28	3312	82 30 30	3326	81 6 49	3341	79 43 25	3356
	Sun	E.	117 12 27	3225	115 46 47	3240	114 21 25	3254	112 56 20	3268
12	Aldebaran	W.	85 10 47	2969	86 41 39	2979	88 12 18	2989	89 42 44	2999
	Pollux	W.	43 46 46	3111	45 14 42	3114	46 42 35	3117	48 10 24	3119
	Spica	E.	48 23 50	2955	46 52 41	2965	45 21 45	2975	43 51 2	2985
	Venus	E.	72 50 23	3421	71 28 30	3433	70 6 51	3444	68 45 24	3454
	Sun	E.	105 54 53	3332	104 31 19	3345	103 7 59	3355	101 44 51	3366
13	Aldebaran	W.	97 12 5	3041	98 41 27	3048	100 10 40	3055	101 39 45	3060
	Pollux	W.	55 28 31	3137	56 55 56	3140	58 23 17	3143	59 50 35	3145
	Spica	E.	36 20 22	3029	34 50 45	3035	33 21 16	3042	31 51 55	3048
	Venus	E.	62 1 1	3501	60 40 38	3509	59 20 24	3516	58 0 18	3523
	Sun	E.	94 52 6	3412	93 30 3	3419	92 8 8	3427	90 46 22	3433
14	Pollux	W.	67 6 19	3156	68 33 21	3158	70 0 21	3158	71 27 21	3158
	Regulus	W.	30 4 16	3151	31 31 24	3147	32 58 37	3143	34 25 54	3140
	Mars	W.	21 40 24	3476	23 1 15	3448	24 22 37	3423	25 44 27	3401
	Venus	E.	51 21 27	3549	50 1 57	3552	48 42 30	3555	47 23 6	3557
	Sun	E.	83 59 9	3458	82 37 58	3461	81 16 51	3463	79 55 46	3466
15	Pollux	W.	78 42 18	3156	80 9 20	3154	81 36 24	3152	83 3 30	3150
	Regulus	W.	41 43 16	3124	43 10 56	3121	44 38 40	3117	46 6 29	3114
	Mars	W.	32 38 57	3325	34 2 40	3313	35 26 36	3302	36 50 45	3292
	Venus	E.	40 46 38	3562	39 27 22	3561	38 8 5	3560	36 48 47	3559
	Sun	E.	73 10 50	3469	71 49 51	3469	70 28 52	3469	69 7 53	3467
16	Pollux	W.	90 19 55	3133	91 47 25	3129	93 15 0	3124	94 42 41	3118
	Regulus	W.	53 26 50	3089	54 55 13	3084	56 23 42	3078	57 52 19	3071
	Mars	W.	43 54 15	3247	45 19 29	3237	46 44 54	3228	48 10 30	3219
	Venus	E.	30 11 45	3545	28 52 10	3542	27 32 32	3538	26 12 49	3533
	Sun	E.	62 22 5	3448	61 0 43	3444	59 39 17	3439	58 17 45	3433
17	Pollux	W.	102 2 44	3090	103 31 6	3083	104 59 36	3076	106 28 14	3069
	Regulus	W.	65 17 27	3036	66 46 55	3027	68 16 34	3019	69 46 23	3010
	Mars	W.	55 21 13	3172	56 47 56	3162	58 14 51	3152	59 41 58	3141
	Sun	E.	51 28 16	3400	50 5 59	3392	48 43 33	3384	47 20 58	3375
18	Regulus	W.	77 18 14	2965	78 49 11	2954	80 20 21	2944	81 51 44	2934

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
9	Spica	E.	79 46 44	2672	78 9 26	2688	76 32 30	2704	74 55 56	2720
	VENUS	E.	101 7 15	3110	99 39 18	3128	98 11 42	3145	96 44 27	3163
10	Aldebaran	W.	66 40 9	2815	68 14 18	2829	69 48 8	2844	71 21 39	2857
	Pollux	W.	26 16 0	3195	27 42 15	3171	29 8 59	3153	30 36 7	3138
	MARS	E.	22 32 6	3225	21 6 27	3288	19 42 2	3362	18 19 2	3447
	Spica	E.	66 58 19	2798	65 23 48	2813	63 49 37	2828	62 15 45	2842
	VENUS	E.	89 33 24	3248	88 8 12	3264	86 43 19	3280	85 18 44	3296
	SUN	E.	122 58 11	3162	121 31 16	3178	120 4 41	3194	118 38 25	3209
11	Aldebaran	W.	79 4 56	2923	80 36 46	2935	82 8 21	2946	83 39 41	2958
	Pollux	W.	37 54 47	3108	39 22 47	3108	40 50 47	3108	42 18 47	3109
	Spica	E.	54 30 51	2909	52 58 43	2921	51 26 51	2932	49 55 13	2944
	VENUS	E.	78 20 18	3370	76 57 27	3383	75 34 51	3396	74 12 30	3408
	SUN	E.	111 31 31	3282	110 6 58	3295	108 42 41	3309	107 18 40	3321
12	Aldebaran	W.	91 12 58	3009	92 43 0	3017	94 12 52	3025	95 42 33	3033
	Pollux	W.	49 38 10	3124	51 5 51	3127	52 33 28	3130	54 1 1	3133
	Spica	E.	42 20 32	2995	40 50 13	3005	39 20 6	3013	37 50 9	3021
	VENUS	E.	67 24 9	3465	66 3 6	3476	64 42 15	3485	63 21 34	3492
	SUN	E.	100 21 56	3376	98 59 12	3386	97 36 40	3395	96 14 18	3404
13	Aldebaran	W.	103 8 43	3066	104 37 34	3072	106 6 18	3076	107 34 57	3080
	Pollux	W.	61 17 50	3148	62 45 1	3151	64 12 9	3153	65 39 15	3154
	Spica	E.	30 22 42	3055	28 53 37	3060	27 24 38	3065	25 55 45	3069
	VENUS	E.	56 40 19	3529	55 20 27	3535	54 0 42	3540	52 41 2	3545
	SUN	E.	89 24 43	3439	88 3 11	3445	86 41 45	3450	85 20 25	3454
14	Pollux	W.	72 54 20	3159	74 21 18	3158	75 48 17	3158	77 15 17	3157
	Regulus	W.	35 53 15	3137	37 20 40	3134	38 48 8	3131	40 15 40	3128
	MARS	W.	27 6 41	3382	28 29 18	3366	29 52 15	3351	31 15 28	3337
	VENUS	E.	46 3 45	3560	44 44 27	3561	43 25 10	3562	42 5 54	3562
	SUN	E.	78 34 44	3468	77 13 44	3470	75 52 46	3470	74 31 48	3470
15	Pollux	W.	84 30 40	3147	85 57 53	3144	87 25 9	3140	88 52 30	3137
	Regulus	W.	47 34 22	3110	49 2 20	3105	50 30 24	3100	51 58 34	3095
	MARS	W.	38 15 5	3283	39 39 36	3274	41 4 18	3265	42 29 11	3256
	VENUS	E.	35 29 28	3557	34 10 7	3555	32 50 43	3552	31 31 16	3548
	SUN	E.	67 46 52	3463	66 25 47	3459	65 4 37	3455	63 43 23	3452
16	Pollux	W.	96 10 29	3113	97 38 23	3108	99 6 23	3102	100 34 30	3096
	Regulus	W.	59 21 4	3065	60 49 57	3058	62 18 58	3051	63 48 8	3043
	MARS	W.	49 36 16	3209	51 2 14	3201	52 28 22	3191	53 54 42	3182
	VENUS	E.	24 53 1	3528	23 33 8	3525	22 13 11	3521	20 53 9	3516
	SUN	E.	56 56 5	3427	55 34 19	3420	54 12 25	3414	52 50 25	3407
17	Pollux	W.	107 57 1	3063	109 25 56	3056	110 54 59	3049	112 24 11	3041
	Regulus	W.	71 16 23	3001	72 46 33	2992	74 16 55	2983	75 47 29	2974
	MARS	W.	61 9 18	3131	62 36 50	3121	64 4 34	3110	65 32 32	3099
	SUN	E.	45 58 13	3366	44 35 18	3358	43 12 13	3348	41 48 57	3338
18	Regulus	W.	83 23 19	2924	84 55 8	2913	86 27 10	2902	87 59 26	2892

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
18	Mars	W.	67 0 43	3087	68 29 8	3076	69 57 46	3065	71 26 38	3054
	Spica	W.	23 16 56	2949	24 48 13	2938	26 19 44	2927	27 51 28	2917
	Sun	E.	40 25 29	3329	39 1 51	3319	37 38 1	3309	36 14 0	3299
19	Mars	W.	78 54 31	2995	80 24 50	2984	81 55 23	2972	83 26 11	2960
	Sun	E.	29 10 55	3247	27 45 41	3237	26 20 16	3227	24 54 39	3218
23	Sun	W.	18 41 46	2901	20 14 3	2887	21 46 39	2874	23 19 31	2861
	a Pegasi	E.	62 51 55	2704	61 15 21	2702	59 38 44	2701	58 2 5	2700
	a Arietis	E.	105 44 27	2564	104 4 43	2555	102 24 47	2546	100 44 38	2538
24	Sun	W.	31 7 27	2811	32 41 40	2804	34 16 3	2795	35 50 37	2787
	a Pegasi	E.	49 59 2	2713	48 22 39	2720	46 46 26	2728	45 10 23	2739
	a Arietis	E.	92 21 6	2499	90 39 52	2492	88 58 28	2486	87 16 55	2480
	Aldebaran	E.	125 33 9	2482	123 51 31	2475	122 9 43	2467	120 27 44	2460
25	Sun	W.	43 45 58	2752	45 21 29	2745	46 57 9	2739	48 32 57	2733
	a Pegasi	E.	37 14 54	2836	35 41 13	2869	34 8 15	2906	32 36 4	2950
	a Arietis	E.	78 47 1	2450	77 4 38	2446	75 22 9	2441	73 39 33	2437
	Aldebaran	E.	111 55 22	2427	110 12 26	2422	108 29 22	2416	106 46 10	2410
26	Sun	W.	56 33 49	2707	58 10 20	2702	59 46 57	2697	61 23 41	2692
	a Aquilæ	W.	37 26 56	3722	38 43 20	3616	40 1 37	3524	41 21 35	3440
	a Arietis	E.	65 5 8	2419	63 22 0	2417	61 38 49	2414	59 55 34	2411
	Aldebaran	E.	98 8 16	2386	96 24 21	2381	94 40 19	2376	92 56 10	2372
27	Sun	W.	69 28 47	2672	71 6 5	2669	72 43 27	2665	74 20 54	2661
	a Aquilæ	W.	48 21 54	3140	49 49 15	3095	51 17 31	3056	52 46 35	3019
	Fomalhaut	W.	28 48 35	6165	29 32 7	5725	30 20 17	5357	31 12 43	5043
	a Arietis	E.	51 18 39	2405	49 35 12	2406	47 51 46	2407	46 8 21	2408
	Aldebaran	E.	84 14 4	2355	82 29 24	2351	80 44 38	2348	78 59 48	2345
28	Sun	W.	82 29 17	2646	84 7 10	2643	85 45 7	2640	87 23 7	2638
	a Aquilæ	W.	60 21 59	2880	61 54 43	2859	63 27 54	2840	65 1 30	2823
	Fomalhaut	W.	36 27 39	4008	37 39 11	3875	38 52 56	3753	40 8 47	3648
	Aldebaran	E.	70 14 35	2331	68 29 21	2329	66 44 4	2327	64 58 44	2326
	Pollux	E.	112 13 49	2401	110 30 16	2397	108 46 37	2393	107 2 52	2389
29	Sun	W.	95 33 59	2626	97 12 18	2624	98 50 40	2623	100 29 4	2621
	Fomalhaut	W.	46 52 54	3268	48 17 43	3213	49 43 37	3164	51 10 29	3120
	Aldebaran	E.	56 11 29	2318	54 25 56	2317	52 40 22	2317	50 54 47	2317
	Pollux	E.	98 22 49	2373	96 38 36	2371	94 54 19	2368	93 9 59	2366
30	Sun	W.	108 41 30	2616	110 20 3	2615	111 58 37	2615	113 37 11	2615
	Fomalhaut	W.	58 36 40	2955	60 7 49	2931	61 39 28	2909	63 11 36	2888
	a Pegasi	W.	37 56 22	2665	39 33 49	2638	41 11 52	2613	42 50 29	2591
	Pollux	E.	84 27 46	2362	82 43 16	2362	80 58 46	2362	79 14 16	2362
31	Sun	W.	121 49 59	2618	123 28 29	2619	125 6 58	2621	126 45 24	2623
	Fomalhaut	W.	70 57 46	2818	72 31 50	2808	74 6 7	2800	75 40 35	2794
	a Pegasi	W.	51 9 57	2517	52 50 47	2507	54 31 51	2499	56 13 6	2491
	Pollux	E.	70 32 9	2370	68 47 52	2373	67 3 39	2377	65 19 31	2381

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh.	P. L. of Diff.	XVIIIh.	P. L. of Diff.	XXIh.	P. L. of Diff.
			° ′ ″		° ′ ″		° ′ ″		° ′ ″	
18	Mars	W.	72 55 44	3043	74 25 4	3031	75 54 38	3019	77 24 27	3007
	Spica	W.	29 23 25	2906	30 55 36	2896	32 28 0	2884	34 0 39	2873
	Sun	E.	34 49 47	3288	33 25 22	3278	32 0 45	3268	30 35 56	3258
19	Mars	W.	84 57 14	2948	86 28 32	2936	88 0 5	2924	89 31 54	2912
	Sun	E.	23 28 51	3209	22 2 52	3199	20 36 42	3192	19 10 23	3185
23	Sun	W.	24 52 40	2850	26 26 1	2840	27 59 37	2830	29 33 26	2821
	a Pegasi	E.	56 25 25	2700	54 48 45	2701	53 12 7	2704	51 35 32	2707
	a Arietis	E.	99 4 18	2530	97 23 47	2522	95 43 4	2514	94 2 10	2507
24	Sun	W.	37 25 22	2779	39 0 17	2772	40 35 21	2765	42 10 35	2758
	a Pegasi	E.	43 34 35	2752	41 59 4	2769	40 23 55	2787	38 49 10	2809
	a Arietis	E.	85 35 13	2473	83 53 22	2467	82 11 23	2462	80 29 16	2456
	Aldebaran	E.	118 45 35	2453	117 3 16	2446	115 20 47	2440	113 38 9	2433
25	Sun	W.	50 8 53	2727	51 44 57	2722	53 21 8	2717	54 57 25	2712
	a Pegasi	E.	31 4 48	3004	29 34 40	3072	28 5 56	3150	26 38 47	3242
	a Arietis	E.	71 56 51	2433	70 14 3	2429	68 31 10	2425	66 48 11	2422
	Aldebaran	E.	105 2 50	2405	103 19 22	2400	101 35 47	2395	99 52 5	2390
26	Sun	W.	63 0 31	2688	64 37 27	2684	66 14 28	2680	67 51 35	2676
	a Aquilæ	W.	42 43 6	3367	44 6 0	3301	45 30 10	3242	46 55 30	3188
	a Arietis	E.	58 12 15	2408	56 28 53	2407	54 45 30	2407	53 2 5	2406
	Aldebaran	E.	91 11 56	2368	89 27 36	2364	87 43 10	2361	85 58 39	2358
27	Sun	W.	75 58 26	2658	77 36 2	2655	79 13 42	2652	80 51 27	2649
	a Aquilæ	W.	54 16 24	2986	55 46 54	2956	57 18 2	2929	58 49 44	2903
	Fomalhaut	W.	32 9 5	4772	33 9 4	4541	34 12 20	4338	35 18 38	4163
	a Arietis	E.	44 24 58	2411	42 41 39	2414	40 58 23	2417	39 15 12	2420
	Aldebaran	E.	77 14 54	2342	75 29 55	2339	73 44 52	2336	71 59 45	2334
28	Sun	W.	89 1 11	2635	90 39 18	2632	92 17 29	2630	93 55 43	2629
	a Aquilæ	W.	66 35 28	2807	68 9 47	2792	69 44 25	2779	71 19 21	2768
	Fomalhaut	W.	41 26 30	3555	42 45 54	3470	44 6 52	3395	45 29 14	3327
	Aldebaran	E.	63 13 22	2324	61 27 57	2322	59 42 30	2321	57 57 1	2319
	Pollux	E.	105 19 2	2385	103 35 6	2381	101 51 4	2378	100 6 59	2375
29	Sun	W.	102 7 30	2620	103 45 58	2619	105 24 27	2618	107 2 58	2617
	Fomalhaut	W.	52 38 14	3081	54 6 47	3044	55 36 5	3011	57 6 4	2981
	Aldebaran	E.	49 9 12	2317	47 23 37	2317	45 38 2	2317	43 52 28	2317
	Pollux	E.	91 25 36	2365	89 41 11	2364	87 56 44	2362	86 12 15	2362
30	Sun	W.	115 15 46	2615	116 54 20	2615	118 32 54	2616	120 11 27	2616
	Fomalhaut	W.	64 44 10	2872	66 17 5	2855	67 50 21	2842	69 23 55	2828
	a Pegasi	W.	44 29 37	2572	46 9 11	2556	47 49 7	2541	49 29 23	2528
	Pollux	E.	77 29 47	2364	75 45 20	2364	74 0 54	2366	72 16 30	2368
31	Sun	W.	128 23 48	2626	130 2 8	2628	131 40 25	2631	133 18 38	2635
	Fomalhaut	W.	77 15 11	2788	78 49 55	2784	80 24 44	2780	81 59 36	2779
	a Pegasi	W.	57 54 32	2485	59 36 7	2480	61 17 49	2475	62 59 37	2471
	Pollux	E.	63 35 29	2385	61 51 33	2390	60 7 44	2396	58 24 3	2403

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	17 15 16.31	+13.747	−21 59 39.6	−36.00	22 34.1
2	17 20 49.97	14.053	22 13 43.7	34.31	22 35.8
3	17 26 30.66	14.333	22 27 4.9	32.43	22 37.6
4	17 32 17.77	14.589	22 39 39.0	30.38	22 39.6
5	17 38 10.78	14.825	22 51 22.1	28.19	22 41.6
6	17 44 9.22	+15.042	−23 2 10.9	−25.86	22 43.7
7	17 50 12.65	15.242	23 12 2.2	23.40	22 45.9
8	17 56 20.70	15.427	23 20 53.2	20.84	22 48.2
9	18 2 33.01	15.598	23 28 41.5	18.18	22 50.5
10	18 8 49.28	15.756	23 35 24.8	15.43	22 52.9
11	18 15 9.23	+15.904	−23 41 1.0	−12.59	22 55.3
12	18 21 32.58	16.041	23 45 28.1	9.67	22 57.8
13	18 27 59.10	16.168	23 48 44.4	6.68	23 0.4
14	18 34 28.57	16.286	23 50 48.2	3.63	23 3.0
15	18 41 0.78	16.396	23 51 38.0	− 0.52	23 5.6
16	18 47 35.54	+16.499	−23 51 12.6	+ 2.65	23 8.3
17	18 54 12.67	16.594	23 49 30.4	5.87	23 11.0
18	19 0 51.99	16.682	23 46 30.4	9.14	23 13.8
19	19 7 33.37	16.765	23 42 11.4	12.45	23 16.6
20	19 14 16.64	16.841	23 36 32.5	15.80	23 19.4
21	19 21 1.67	+16.911	−23 29 32.5	+19.20	23 22.2
22	19 27 48.32	16.976	23 21 10.6	22.63	23 25.1
23	19 34 36.47	17.036	23 11 25.9	26.10	23 28.0
24	19 41 26.01	17.091	23 0 17.6	29.60	23 30.9
25	19 48 16.81	17.142	22 47 45.0	33.13	23 33.8
26	19 55 8.78	+17.188	−22 33 47.2	+36.68	23 36.7
27	20 2 1.81	17.230	22 18 23.9	40.27	23 39.7
28	20 8 55.81	17.269	22 1 34.1	43.88	23 42.7
29	20 15 50.70	17.304	21 43 17.5	47.51	23 45.7
30	20 22 46.38	17.335	21 23 33.5	51.16	23 48.7
31	20 29 42.77	+17.364	−21 2 21.7	+54.83	23 51.7
32	20 36 39.81	+17.389	−20 39 41.6	+58.51	23 54.7

FEBRUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	20 36 39.81	+17.389	−20 39 41.6	+58.51	23 54.7
2	20 43 37.41	17.411	20 15 32.9	62.21	23 57.8
3	20 50 35.50	17.430	19 49 55.3	65.92	
4	20 57 34.03	17.447	19 22 48.6	69.64	0 0.8
5	21 4 32.92	17.460	18 54 12.6	73.36	0 3.8
6	21 11 32.11	+17.471	−18 24 7.2	+77.08	0 6.9
7	21 18 31.53	17.480	17 52 32.5	80.80	0 9.9
8	21 25 31.11	17.485	17 19 28.7	84.51	0 13.0
9	21 32 30.76	17.486	16 44 56.2	88.20	0 16.1
10	21 39 30.41	17.484	16 8 55.1	91.87	0 19.1
11	21 46 29.95	+17.477	−15 31 26.5	+95.50	0 22.2
12	21 53 29.26	17.465	14 52 31.2	99.10	0 25.2
13	22 0 28.20	17.446	14 12 10.3	102.63	0 28.3
14	22 7 26.60	17.419	13 30 25.6	106.08	0 31.3
15	22 14 24.25	17.383	12 47 19.1	109.45	0 34.3
16	22 21 20.89	+17.336	−12 2 53.2	+112.69	0 37.3
17	22 28 16.26	17.275	11 17 11.1	115.79	0 40.3
18	22 35 9.97	17.198	10 30 16.5	118.72	0 43.3
19	22 42 1.60	17.101	9 42 14.0	121.45	0 46.2
20	22 48 50.64	16.981	8 53 9.1	123.92	0 49.1
21	22 55 36.48	+16.834	− 8 3 8.3	+126.09	0 51.9
22	23 2 18.41	16.654	7 12 19.1	127.95	0 54.7
23	23 8 55.60	16.438	6 20 50.4	129.38	0 57.3
24	23 15 27.09	16.179	5 28 52.3	130.38	0 59.9
25	23 21 51.80	15.871	4 36 36.5	130.85	1 2.4
26	23 28 8.49	+15.510	− 3 44 16.0	+130.76	1 4.7
27	23 34 15.81	15.089	2 52 5.3	130.03	1 6.9
28	23 40 12.24	14.602	2 0 20.3	128.61	1 8.9
29	23 45 56.16	14.046	1 9 18.1	126.45	1 10.7
30	23 51 25.85	13.415	− 0 19 17.0	123.51	1 12.2
31	23 56 39.50	+12.709	+ 0 29 23.9	+119.76	1 13.5
32	0 1 35.28	+11.926	+ 1 16 25.0	+115.19	1 14.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter .	2.90	2.72	2.59	2.50	2.43	2.39	2.37
Hor. Parallax .	7.69	7.21	6.86	6.61	6.44	6.33	6.28

Day of the Month.	5th.	10th.	15th.	20th.	25th.
	″	″	″	″	″
Semidiameter . .	2.38	2.41	2.48	2.59	2.79
Hor. Parallax . .	6.29	6.38	6.55	6.87	7.39

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

	MARCH.						APRIL.				
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	23 45 56.16	+14.046	−1 9 18.1	+126.45	1 10.7	1	23 51 27.63	− 4.123	+0 42 58.4	−70.13	23 8.6
2	23 51 25.85	13.415	−0 19 17.0	123.51	1 12.2	2	23 49 57.96	3.343	+0 15 50.3	65.43	23 3.5
3	23 56 39.50	12.709	+0 29 23.9	119.76	1 13.5	3	23 48 47.39	2.534	−0 9 17.4	60.12	22 58.7
4	0 1 35.28	11.926	1 16 25.0	115.19	1 14.5	4	23 47 56.45	1.710	0 32 11.8	54.35	22 54.3
5	0 6 11.31	11.065	2 1 26.4	109.79	1 15.1	5	23 47 25.35	0.883	0 52 43.4	48.24	22 50.2
6	0 10 25.77	+10.131	+2 44 8.2	+103.56	1 15.4	6	23 47 14.03	− 0.062	−1 10 45.4	−41.90	22 46.4
7	0 14 16.91	9.124	3 24 11.0	96.54	1 15.3	7	23 47 22.24	+ 0.743	1 26 13.6	35.44	22 42.9
8	0 17 43.09	8.050	4 1 15.9	88.75	1 14.7	8	23 47 49.55	1.528	1 39 6.1	28.93	22 39.7
9	0 20 42.85	6.921	4 35 5.1	80.24	1 13.8	9	23 48 35.40	2.288	1 49 22.5	22.44	22 36.8
10	0 23 14.90	5.743	5 5 22.0	71.06	1 12.3	10	23 49 39.14	3.019	1 57 4.0	16.03	22 34.2
11	0 25 18.21	+ 4.528	+5 31 51.2	+ 61.28	1 10.4	11	23 51 0.08	+ 3.720	−2 2 12.7	− 9.72	22 31.8
12	0 26 52.05	3.289	5 54 19.3	50.97	1 8.0	12	23 52 37.45	4.389	2 4 51.8	− 3.56	22 29.8
13	0 27 55.99	2.039	6 12 34.5	40.22	1 5.1	13	23 54 30.50	5.026	2 5 5.0	+ 2.44	22 28.0
14	0 28 29.96	+ 0.795	6 26 27.1	29.11	1 1.8	14	23 56 38.45	5.631	2 2 56.2	8.27	22 26.4
15	0 28 34.32	− 0.426	6 35 50.0	17.76	0 57.9	15	23 59 0.58	6.207	1 58 30.0	13.89	22 25.0
16	0 28 9.84	− 1.605	+6 40 39.0	+ 6.31	0 53.5	16	0 1 36.16	+ 6.753	−1 51 50.8	+19.34	22 23.8
17	0 27 17.78	2.722	6 40 53.2	− 5.11	0 48.7	17	0 4 24.51	7.272	1 43 3.2	24.59	22 22.9
18	0 25 59.85	3.757	6 36 35.2	16.34	0 43.5	18	0 7 24.98	7.763	1 32 12.0	29.65	22 22.1
19	0 24 18.24	4.691	6 27 52.1	27.18	0 37.8	19	0 10 36.95	8.231	1 19 21.3	34.53	22 21.6
20	0 22 15.61	5.506	6 14 55.3	37.44	0 31.9	20	0 13 59.87	8.676	1 4 36.0	39.21	22 21.2
21	0 19 55.01	− 6.186	+5 58 0.9	− 46.94	0 25.6	21	0 17 33.22	+ 9.100	−0 48 0.4	+43.72	22 20.9
22	0 17 19.86	6.717	5 37 29.4	55.50	0 19.1	22	0 21 16.52	9.506	0 29 38.4	48.07	22 20.9
23	0 14 33.84	7.091	5 13 45.8	62.93	0 12.4	23	0 25 9.34	9.893	−0 9 34.6	52.23	22 20.9
24	0 11 40.77	7.304	4 47 18.8	69.10	0 5.6 23 58.8	24	0 29 11.30	10.267	+0 12 7.4	56.24	22 21.2
25	0 8 44.53	7.355	4 18 40.0	73.90	23 52.0	25	0 33 22.05	10.627	0 35 23.7	60.09	22 21.5
26	0 5 48.91	− 7.253	+3 48 22.7	− 77.29	23 45.2	26	0 37 41.30	+10.975	+1 0 10.6	+63.79	22 22.0
27	0 2 57.53	7.004	3 17 1.6	79.23	23 38.5	27	0 42 8.78	11.314	1 26 24.5	67.34	22 22.7
28	0 0 13.73	6.624	2 45 10.5	79.79	23 32.1	28	0 46 44.29	11.644	1 54 2.0	70.76	22 23.5
29	23 57 40.49	6.128	2 13 21.9	79.04	23 25.8	29	0 51 27.64	11.968	2 22 59.8	74.03	22 24.4
30	23 55 20.37	5.534	1 42 6.1	77.09	23 19.8	30	0 56 18.71	12.287	2 53 14.6	77.18	22 25.4
31	23 53 15.52	− 4.859	+1 11 50.3	− 74.06	23 14.1	31	1 1 17.39	+12.603	+3 24 43.3	+80.19	22 26.5
32	23 51 27.63	− 4.123	+0 42 58.4	− 70.13	23 8.6	32	1 6 23.62	+12.917	+3 57 22.7	+83.07	22 27.8

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . . .	3.09	3.54	4.13	4.78	5.35	5.60	Semidiameter . . .	5.51	5.19	4.77	4.35	3.97	3.65
Hor. Parallax . . .	8.20	9.38	10.95	12.70	14.17	14.85	Hor. Parallax . . .	14.61	13.74	12.64	11.53	10.53	9.66

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ″	″	h m		h m s	s	° ′ ″	″	h m
1	1 1 17.39	+12.603	+ 3 24 43.3	+ 80.19	22 26.5	1	4 46 49.90	+23.510	+23 20 21.7	+63.75	0 8.8
2	1 6 23.62	12.917	3 57 22.7	83.07	22 27.8	2	4 56 14.78	23.553	23 44 34.5	57.27	0 14.3
3	1 11 37.38	13.230	4 31 9.8	85.83	22 29.2	3	5 5 39.97	23.535	24 6 8.9	50.56	0 19.8
4	1 16 58.68	13.545	5 6 1.5	88.46	22 30.8	4	5 15 3.98	23.456	24 25 0.2	43.69	0 25.3
5	1 22 27.57	13.862	5 41 54.8	90.96	22 32.4	5	5 24 25.38	23.318	24 41 5.6	36.75	0 30.7
6	1 28 4.11	+14.184	+ 6 18 46.5	+ 93.33	22 34.2	6	5 33 42.78	+23.123	+24 54 24.1	+29.80	0 36.1
7	1 33 48.42	14.510	6 56 33.5	95.56	22 36.1	7	5 42 54.86	22.875	25 4 56.2	22.89	0 41.3
8	1 39 40.64	14.843	7 35 12.5	97.66	22 38.2	8	5 52 0.45	22.583	25 12 43.9	16.11	0 46.5
9	1 45 40.93	15.182	8 14 40.1	99.61	22 40.4	9	6 0 58.47	22.246	25 17 50.7	9.49	0 51.5
10	1 51 49.46	15.531	8 54 52.6	101.41	22 42.7	10	6 9 47.96	21.873	25 20 21.1	+ 3.08	0 56.4
11	1 58 6.47	+15.888	+ 9 35 46.3	+103.04	22 45.2	11	6 18 28.08	+21.467	+25 20 20.5	− 3.09	1 1.2
12	2 4 32.18	16.256	10 17 17.2	104.50	22 47.8	12	6 26 58.12	21.033	25 17 55.0	8.99	1 5.7
13	2 11 6.84	16.634	10 59 20.8	105.77	22 50.6	13	6 35 17.47	20.576	25 13 11.3	14.60	1 10.1
14	2 17 50.70	17.023	11 41 52.4	106.83	22 53.6	14	6 43 25.64	20.102	25 6 16.6	19.91	1 14.3
15	2 24 44.02	17.423	12 24 46.8	107.66	22 56.7	15	6 51 22.21	19.611	24 57 18.0	24.92	1 18.3
16	2 31 47.07	+17.833	+13 7 58.3	+108.25	23 0.0	16	6 59 6.85	+19.108	+24 46 23.1	−29.61	1 22.1
17	2 39 0.10	18.254	13 51 20.7	108.57	23 3.4	17	7 6 39.29	18.595	24 33 39.3	33.99	1 25.7
18	2 46 23.34	18.684	14 34 47.3	108.59	23 7.0	18	7 13 59.33	18.074	24 19 14.1	38.06	1 29.1
19	2 53 56.97	19.120	15 18 10.4	108.28	23 10.8	19	7 21 6.80	17.547	24 3 15.0	41.82	1 32.3
20	3 1 41.15	19.562	16 1 22.0	107.62	23 14.8	20	7 28 1.57	17.016	23 45 49.1	45.28	1 35.3
21	3 9 35.95	+20.005	+16 44 13.0	+106.56	23 18.9	21	7 34 43.55	+16.481	+23 27 3.7	−48.45	1 38.0
22	3 17 41.37	20.446	17 26 33.7	105.06	23 23.3	22	7 41 12.65	15.943	23 7 5.8	51.33	1 40.5
23	3 25 57.31	20.881	18 8 13.7	103.16	23 27.8	23	7 47 28.81	15.403	22 46 2.1	53.92	1 42.8
24	3 34 23.56	21.304	18 49 1.8	100.76	23 32.5	24	7 53 31.97	14.860	22 23 59.7	56.25	1 44.9
25	3 42 59.77	21.710	19 28 46.4	97.86	23 37.3	25	7 59 22.05	14.313	22 1 4.4	58.31	1 46.8
26	3 51 45.43	+22.091	+20 7 15.3	+ 94.45	23 42.3	26	8 4 58.99	+13.765	+21 37 23.2	−60.09	1 48.5
27	4 0 39.88	22.441	20 44 16.1	90.53	23 47.4	27	8 10 22.72	13.212	21 13 2.4	61.61	1 49.9
28	4 9 42.29	22.754	21 19 36.4	86.10	23 52.6	28	8 15 33.14	12.655	20 48 8.0	62.88	1 51.1
29	4 18 51.71	23.022	21 53 4.1	81.17	23 57.9	29	8 20 30.14	12.094	20 22 46.3	63.89	1 52.1
30	4 28 6.96	23.240	22 24 27.8	75.75		30	8 25 13.60	11.527	19 57 3.3	64.65	1 52.9
31	4 37 26.81	+23.404	+22 53 36.8	+ 69.93	0 3.4	31	8 29 43.38	+10.953	+19 31 5.0	−65.16	1 53.4
32	4 46 49.90	+23.510	+23 20 21.7	+ 63.75	0 8.8	32	8 33 59.30	+10.372	+19 4 57.4	−65.42	1 53.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter .	3.36	3.12	2.91	2.74	2.62	2.54	2.53
Hor. Parallax .	8.91	8.26	7.71	7.26	6.93	6.73	6.70

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . . .	2.59	2.71	2.89	3.13	3.39	3.71
Hor. Parallax . . .	6.86	7.19	7.66	8.27	8.99	9.84

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	8 29 43.38	+10.953	+19 31 5.0	−65.16	1 53.4	1	8 38 24.89	− 7.272	+13 24 49.0	+36.05	23 53.1
2	8 33 59.30	10.372	19 4 57.4	65.42	1 53.7	2	8 35 33.23	7.011	13 39 53.4	39.22	23 46.5
3	8 38 1.16	9.782	18 38 46.6	65.43	1 53.8	3	8 32 49.43	6.616	13 56 7.1	41.82	23 40.0
4	8 41 48.74	9.182	18 12 38.7	65.19	1 53.6	4	8 30 16.72	6.089	14 13 15.7	43.80	23 33.8
5	8 45 21.80	8.571	17 46 39.6	64.69	1 53.2	5	8 27 58.15	5.438	14 31 4.4	45.15	23 27.8
6	8 48 40.05	+ 7.948	+17 20 55.6	−63.93	1 52.6	6	8 25 56.63	− 4.670	+14 49 17.8	+45.86	23 22.2
7	8 51 43.19	7.312	16 55 33.2	62.95	1 51.7	7	8 24 14.83	3.796	15 7 40.6	45.93	23 16.9
8	8 54 30.90	6.662	16 30 38.3	61.67	1 50.5	8	8 22 55.15	2.829	15 25 57.5	45.38	23 12.0
9	8 57 2.83	5.996	16 6 17.3	60.07	1 49.1	9	8 21 59.67	1.781	15 43 53.7	44.21	23 7.6
10	8 59 18.60	5.315	15 42 37.4	58.22	1 47.4	10	8 21 30.13	− 0.669	16 1 14.8	42.45	23 3.6
11	9 1 17.85	+ 4.619	+15 19 45.1	−56.09	1 45.4	11	8 21 27.98	+ 0.497	+16 17 46.7	+40.12	23 0.1
12	9 3 0.18	3.906	14 57 47.2	53.66	1 43.1	12	8 21 54.32	1.703	16 33 16.0	37.24	22 57.1
13	9 4 25.20	3.177	14 36 50.9	50.97	1 40.6	13	8 22 49.94	2.935	16 47 29.7	33.82	22 54.6
14	9 5 32.54	2.433	14 17 3.1	47.96	1 37.8	14	8 24 15.31	4.180	17 0 15.4	29.90	22 52.5
15	9 6 21.87	1.676	13 58 31.2	44.65	1 34.6	15	8 26 10.62	5.428	17 11 21.0	25.49	22 51.0
16	9 6 52.89	+ 0.907	+13 41 22.2	−41.04	1 31.2	16	8 28 35.78	+ 6.667	+17 20 35.1	+20.60	22 49.9
17	9 7 5.35	+ 0.130	13 25 43.5	37.14	1 27.4	17	8 31 30.42	7.884	17 27 46.7	15.29	22 49.3
18	9 6 59.10	− 0.652	13 11 42.0	32.94	1 23.4	18	8 34 53.97	9.072	17 32 45.4	9.54	22 49.2
19	9 6 34.08	1.432	12 59 24.6	28.46	1 19.0	19	8 38 45.58	10.221	17 35 21.5	+ 3.41	22 49.6
20	9 5 50.39	2.207	12 48 57.8	23.74	1 14.3	20	8 43 4.18	11.321	17 35 26.1	− 3.08	22 50.3
21	9 4 48.26	− 2.967	+12 40 27.2	−18.77	1 9.4	21	8 47 48.50	+12.362	+17 32 51.2	− 9.87	22 51.5
22	9 3 28.15	3.704	12 33 58.5	13.61	1 4.1	22	8 52 57.04	13.338	17 27 30.2	16.91	22 53.1
23	9 1 50.73	4.408	12 29 35.5	8.29	0 58.6	23	8 58 28.13	14.240	17 19 17.6	24.15	22 55.0
24	8 59 56.92	5.066	12 27 21.9	− 2.85	0 52.7	24	9 4 19.91	15.061	17 8 9.7	31.52	22 57.2
25	8 57 47.93	5.669	12 27 19.3	+ 2.63	0 46.6	25	9 10 30.40	15.797	16 54 4.6	38.91	22 59.7
26	8 55 25.26	− 6.202	+12 29 28.0	+ 8.08	0 40.3	26	9 16 57.48	+16.444	+16 37 2.2	−46.27	23 2.5
27	8 52 50.77	6.656	12 33 46.6	13.45	0 33.8	27	9 23 38.99	16.999	16 17 4.4	53.51	23 5.4
28	8 50 6.55	7.012	12 40 12.0	18.63	0 27.2	28	9 30 32.72	17.463	15 54 15.4	60.55	23 8.5
29	8 47 15.04	7.261	12 48 38.9	23.56	0 20.4	29	9 37 36.51	17.838	15 28 40.6	67.30	23 11.8
30	8 44 18.95	7.392	12 59 0.3	28.16	0 13.6	30	9 44 48.25	18.126	15 0 27.7	73.69	23 15.2
31	8 41 21.20	− 7.398	+13 11 7.2	+32.34	0 6.7 23 59.9	31	9 52 5.93	+18.334	+14 29 45.4	−79.71	23 18.6
32	8 38 24.89	− 7.272	+13 24 49.0	+36.05	23 53.1	32	9 59 27.69	+18.467	+13 56 43.8	−85.32	23 22.1

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . . .	4.07	4.48	4.90	5.30	5.59	5.65	Semidiameter . . .	5.41	4.90	4.28	3.69	3.21	2.86
Hor. Parallax . . .	10.79	11.86	12.98	14.04	14.82	14.97	Hor. Parallax . . .	14.32	12.97	11.33	9.78	8.51	7.59

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	9 59 27.69	+18.467	+13 56 43.8	− 85.32	23 22.1
2	10 6 51.84	18.534	13 21 33.7	90.44	23 25.5
3	10 14 16.88	18.543	12 44 26.5	95.08	23 29.0
4	10 21 41.50	18.501	12 5 33.7	99.24	23 32.4
5	10 29 4.57	18.416	11 25 6.8	102.93	23 35.9
6	10 36 25.18	+18.297	+10 43 17.0	−106.15	23 39.2
7	10 43 42.58	18.149	10 0 15.2	108.94	23 42.5
8	10 50 56.17	17.980	9 16 11.4	111.31	23 45.8
9	10 58 5.51	17.797	8 31 15.4	113.30	23 48.9
10	11 5 10.27	17.600	7 45 36.0	114.94	23 52.0
11	11 12 10.26	+17.398	+ 6 59 21.1	−116.25	23 55.0
12	11 19 5.34	17.192	6 12 38.6	117.25	23 57.8
13	11 25 55.47	16.986	5 25 35.1	118.00	
14	11 32 40.68	16.782	4 38 16.7	118.49	0 0.6
15	11 39 21.02	16.581	3 50 49.1	118.77	0 3.4
16	11 45 56.60	+16.386	+ 3 3 17.3	−118.83	0 6.0
17	11 52 27.57	16.196	2 15 45.8	118.74	0 8.6
18	11 58 54.07	16.014	1 28 18.8	118.48	0 11.1
19	12 5 16.29	15.839	+ 0 40 59.8	118.08	0 13.5
20	12 11 34.42	15.673	− 0 6 7.7	117.53	0 15.9
21	12 17 48.65	+15.514	− 0 53 0.8	−116.87	0 18.2
22	12 23 59.17	15.363	1 39 36.7	116.10	0 20.5
23	12 30 6.19	15.222	2 25 52.9	115.23	0 22.6
24	12 36 9.90	15.088	3 11 47.2	114.28	0 24.7
25	12 42 10.50	14.963	3 57 17.5	113.23	0 26.8
26	12 48 8.18	+14.845	− 4 42 21.8	−112.11	0 28.8
27	12 54 3.12	14.734	5 26 58.4	110.92	0 30.8
28	12 59 55.49	14.631	6 11 5.6	109.67	0 32.7
29	13 5 45.47	14.535	6 54 41.9	108.35	0 34.6
30	13 11 33.20	14.444	7 37 45.8	106.96	0 36.5
31	13 17 18.83	+14.360	− 8 20 15.8	−105.53	0 38.3
32	13 23 2.51	+14.281	− 9 2 10.6	−104.03	0 40.1

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter . . .	2.63	2.50	2.42	2.39	2.39	2.41
Hor. Parallax . . .	6.98	6.61	6.41	6.33	6.33	6.39

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	13 17 18.83	+14.360	− 8 20 15.8	−105.53	0 38.3
2	13 23 2.51	14.281	9 2 10.6	104.03	0 40.1
3	13 28 44.34	14.207	9 43 28.9	102.48	0 41.9
4	13 34 24.47	14.138	10 24 9.2	100.87	0 43.6
5	13 40 2.98	14.072	11 4 10.6	99.22	0 45.3
6	13 45 39.95	+14.009	−11 43 31.6	− 97.52	0 47.0
7	13 51 15.46	13.950	12 22 11.0	95.76	0 48.6
8	13 56 49.58	13.893	13 0 7.5	93.94	0 50.2
9	14 2 22.33	13.836	13 37 19.8	92.07	0 51.8
10	14 7 53.74	13.781	14 13 46.6	90.15	0 53.4
11	14 13 23.82	+13.726	−14 49 26.5	− 88.17	0 55.0
12	14 18 52.56	13.668	15 24 18.2	86.13	0 56.5
13	14 24 19.89	13.609	15 58 20.2	84.03	0 58.0
14	14 29 45.76	13.546	16 31 31.0	81.86	0 59.5
15	14 35 10.06	13.478	17 3 49.0	79.63	1 1.0
16	14 40 32.66	+13.404	−17 35 12.6	− 77.33	1 2.4
17	14 45 53.38	13.326	18 5 40.1	74.95	1 3.8
18	14 51 12.02	13.230	18 35 9.6	72.50	1 5.2
19	14 56 28.32	13.126	19 3 39.3	69.96	1 6.5
20	15 1 41.98	13.009	19 31 7.0	67.34	1 7.8
21	15 6 52.64	+12.875	−19 57 30.7	− 64.62	1 9.0
22	15 11 59.86	12.722	20 22 48.2	61.81	1 10.2
23	15 17 3.15	12.548	20 46 56.9	58.90	1 11.3
24	15 22 1.96	12.348	21 9 54.3	55.87	1 12.3
25	15 26 55.61	12.118	21 31 37.7	52.72	1 13.3
26	15 31 43.35	+11.855	−21 52 4.1	− 49.45	1 14.2
27	15 36 24.32	11.552	22 11 10.2	46.04	1 14.9
28	15 40 57.51	11.207	22 28 53.0	42.48	1 15.5
29	15 45 21.84	10.811	22 45 8.2	38.76	1 15.9
30	15 49 36.00	10.359	22 59 52.2	34.87	1 16.2
31	15 53 38.57	+ 9.844	−23 13 0.3	− 30.77	1 16.3
32	15 57 27.92	+ 9.257	−23 24 27.7	− 26.47	1 16.2

Day of the Month.	3d.	8th.	13th	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter . . .	2.46	2.53	2.63	2.77	2.95	3.19
Hor. Parallax . . .	6.52	6.71	6.97	7.33	7.81	8.44

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	15 57 27.92	+ 9.257	−23 24 27.7	−26.47	1 16.2
2	16 1 2.26	8.591	23 34 9.0	21.92	1 15.8
3	16 4 19.57	7.836	23 41 58.1	17.13	1 15.1
4	16 7 17.63	6.985	23 47 48.9	12.04	1 14.1
5	16 9 54.01	6.029	23 51 33.5	6.62	1 12.8
6	16 12 6.09	+ 4.959	−23 53 3.8	− 0.84	1 11.0
7	16 13 51.08	3.770	23 52 10.8	+ 5.33	1 8.8
8	16 15 6.07	2.458	23 48 44.6	11.94	1 6.1
9	16 15 48.12	+ 1.026	23 42 34.3	19.00	1 2.8
10	16 15 54.40	− 0.521	23 33 29.0	26.54	0 59.0
11	16 15 22.33	− 2.167	−23 21 16.8	+34.55	0 54.5
12	16 14 9.83	3.885	23 5 47.3	42.98	0 49.3
13	16 12 15.61	5.636	22 46 51.5	51.73	0 43.5
14	16 9 39.46	7.369	22 24 23.5	60.61	0 37.0
15	16 6 22.62	9.015	21 58 23.6	69.34	0 29.8
16	16 2 28.07	−10.497	−21 28 59.7	+77.54	0 21.9
17	15 58 0.73	11.733	20 56 29.7	84.74	0 13.6
18	15 53 7.48	12.643	20 21 24.0	90.42	0 4.8 23 55.8
19	15 47 56.98	13.161	19 44 25.6	94.04	23 46.6
20	15 42 39.20	13.245	19 6 29.2	95.19	23 37.4
21	15 37 24.76	−12.883	−18 28 38.5	+93.55	23 28.5
22	15 32 24.17	12.097	17 52 0.8	89.11	23 20.0
23	15 27 47.05	10.939	17 17 41.9	82.05	23 12.0
24	15 23 41.49	9.481	16 46 39.9	72.77	23 4.6
25	15 20 13.68	7.808	16 19 42.0	61.82	22 57.9
26	15 17 27.75	− 6.005	−15 57 20.9	+49.81	22 51.9
27	15 15 25.88	4.153	15 39 54.7	37.34	22 46.7
28	15 14 8.50	2.307	15 27 28.4	24.91	22 42.1
29	15 13 34.70	− 0.525	15 19 55.2	12.96	22 38.3
30	15 13 42.55	+ 1.160	15 17 0.1	+ 1.78	22 35.1
31	15 14 29.44	+ 2.726	−15 18 21.9	− 8.42	22 32.5
32	15 15 52.39	+ 4.164	−15 23 35.8	−17.55	22 30.5

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	15 14 29.44	+ 2.726	−15 18 21.9	− 8.42	22 32.5
2	15 15 52.39	4.164	15 23 35.8	17.55	22 30.5
3	15 17 48.27	5.470	15 32 15.4	25.56	22 28.9
4	15 20 13.94	6.648	15 43 53.9	32.47	22 27.8
5	15 23 6.39	7.703	15 58 5.5	38.33	22 27.1
6	15 26 22.79	+ 8.646	−16 14 25.9	−43.21	22 26.8
7	15 30 0.57	9.486	16 32 32.4	47.19	22 26.8
8	15 33 57.37	10.233	16 52 4.5	50.35	22 27.1
9	15 38 11.11	10.899	17 12 43.5	52.78	22 27.6
10	15 42 39.93	11.491	17 34 12.9	54.56	22 28.3
11	15 47 22.19	+12.020	−17 56 17.9	−55.77	22 29.3
12	15 52 16.46	12.493	18 18 45.5	56.47	22 30.4
13	15 57 21.48	12.917	18 41 24.2	56.70	22 31.7
14	16 2 36.15	13.299	19 4 3.9	56.54	22 33.2
15	16 7 59.54	13.643	19 26 35.6	56.04	22 34.7
16	16 13 30.77	+13.955	−19 48 51.4	−55.23	22 36.4
17	16 19 9.16	14.240	20 10 44.4	54.15	22 38.2
18	16 24 54.08	14.499	20 32 8.4	52.82	22 40.1
19	16 30 44.96	14.738	20 52 58.1	51.28	22 42.1
20	16 36 41.34	14.957	21 13 8.2	49.54	22 44.2
21	16 42 42.78	+15.160	−21 32 34.8	−47.67	22 46.4
22	16 48 48.91	15.349	21 51 13.8	45.59	22 48.6
23	16 54 59.40	15.524	22 9 1.8	43.39	22 50.9
24	17 1 13.98	15.688	22 25 55.6	41.07	22 53.3
25	17 7 32.36	15.841	22 41 52.3	38.64	22 55.7
26	17 13 54.30	+15.986	−22 56 49.3	−36.10	22 58.2
27	17 20 19.62	16.122	23 10 44.2	33.46	23 0.7
28	17 26 48.11	16.251	23 23 34.8	30.74	23 3.3
29	17 33 19.60	16.372	23 35 19.0	27.93	23 5.9
30	17 39 53.92	16.487	23 45 55.0	25.05	23 8.6
31	17 46 30.92	+16.596	−23 55 20.9	−22.10	23 11.3
32	17 53 10.47	+16.699	−24 3 35.1	−19.07	23 14.1

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . . .	3.51	3.94	4.45	4.87	4.86	4.39
Hor. Parallax . . .	9.30	10.43	11.78	12.89	12.87	11.63

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″	″
Semidiameter .	3.82	3.35	3.02	2.78	2.62	2.50	2.42
Hor. Parallax .	10.12	8.88	8.00	7.38	6.96	6.63	6.42

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	20 39 23.93	+12.819	−20 9 51.7	+46.64	1 56.8	1	23 7 46.06	+11.233	−6 58 20.4	+75.82	2 22.9
2	20 44 30.90	12.763	19 50 55.3	48.06	1 57.9	2	23 12 15.26	11.199	6 27 55.5	76.24	2 23.4
3	20 49 36.51	12.706	19 31 25.0	49.45	1 59.1	3	23 16 43.65	11.167	5 57 20.9	76.63	2 23.9
4	20 54 40.75	12.648	19 11 21.7	50.82	2 0.2	4	23 21 11.26	11.136	5 26 37.4	76.99	2 24.5
5	20 59 43.61	12.590	18 50 46.0	52.15	2 1.3	5	23 25 38.14	11.106	4 55 45.8	77.31	2 25.0
6	21 4 45.08	+12.532	−18 29 38.8	+53.45	2 2.4	6	23 30 4.31	+11.077	−4 24 46.7	+77.60	2 25.5
7	21 9 45.15	12.474	18 8 0.8	54.72	2 3.5	7	23 34 29.81	11.050	3 53 41.1	77.86	2 25.9
8	21 14 43.82	12.415	17 45 52.7	55.95	2 4.5	8	23 38 54.68	11.024	3 22 29.6	78.09	2 26.4
9	21 19 41.08	12.357	17 23 15.4	57.15	2 5.5	9	23 43 18.95	11.000	2 51 13.0	78.29	2 26.9
10	21 24 36.95	12.299	17 0 9.6	58.32	2 6.5	10	23 47 42.66	10.978	2 19 52.0	78.46	2 27.3
11	21 29 31.42	+12.241	−16 36 36.1	+59.46	2 7.5	11	23 52 5.85	+10.957	−1 48 27.4	+78.60	2 27.7
12	21 34 24.51	12.183	16 12 35.7	60.57	2 8.4	12	23 56 28.56	10.937	1 16 59.8	78.70	2 28.2
13	21 39 16.22	12.126	15 48 9.2	61.64	2 9.3	13	0 0 50.82	10.919	0 45 29.9	78.77	2 28.6
14	21 44 6.57	12.070	15 23 17.3	62.68	2 10.2	14	0 5 12.68	10.903	−0 13 58.6	78.82	2 29.1
15	21 48 55.57	12.014	14 58 0.9	63.69	2 11.1	15	0 9 34.17	10.889	+0 17 33.5	78.84	2 29.5
16	21 53 43.25	+11.959	−14 32 20.7	+64.66	2 11.9	16	0 13 55.34	+10.876	+0 49 5.7	+78.83	2 29.9
17	21 58 29.61	11.905	14 6 17.5	65.60	2 12.8	17	0 18 16.22	10.865	1 20 37.2	78.79	2 30.3
18	22 3 14.70	11.852	13 39 52.0	66.51	2 13.6	18	0 22 36.86	10.856	1 52 7.4	78.72	2 30.7
19	22 7 58.53	11.800	13 13 5.1	67.39	2 14.3	19	0 26 57.29	10.848	2 23 35.6	78.62	2 31.1
20	22 12 41.11	11.749	12 45 57.6	68.23	2 15.1	20	0 31 17.54	10.841	2 55 1.0	78.49	2 31.5
21	22 17 22.48	+11.699	−12 18 30.2	+69.04	2 15.8	21	0 35 37.66	+10.836	+3 26 23.0	+78.33	2 31.9
22	22 22 2.67	11.650	11 50 43.7	69.83	2 16.6	22	0 39 57.69	10.833	3 57 40.8	78.14	2 32.3
23	22 26 41.70	11.602	11 22 38.8	70.58	2 17.3	23	0 44 17.66	10.832	4 28 53.8	77.92	2 32.6
24	22 31 19.60	11.556	10 54 16.6	71.29	2 18.0	24	0 48 37.62	10.832	5 0 1.2	77.68	2 33.0
25	22 35 56.41	11.511	10 25 37.6	71.97	2 18.7	25	0 52 57.59	10.833	5 31 2.4	77.41	2 33.4
26	22 40 32.15	+11.468	− 9 56 42.5	+72.62	2 19.3	26	0 57 17.62	+10.836	+6 1 56.6	+77.11	2 33.8
27	22 45 6.86	11.426	9 27 32.1	73.24	2 19.9	27	1 1 37.74	10.840	6 32 43.2	76.77	2 34.2
28	22 49 40.57	11.385	8 58 7.4	73.82	2 20.5	28	1 5 57.96	10.846	7 3 21.4	76.40	2 34.6
29	22 54 13.32	11.345	8 28 29.0	74.37	2 21.1	29	1 10 18.33	10.853	7 33 50.5	76.01	2 35.0
30	22 58 45.13	11.306	7 58 38.0	74.89	2 21.7	30	1 14 38.88	10.860	8 4 9.8	75.59	2 35.4
31	23 3 16.03	+11.269	− 7 28 34.9	+75.37	2 22.3	31	1 18 59.62	+10.869	+8 34 18.5	+75.14	2 35.8
32	23 7 46.06	+11.233	− 6 58 20.4	+75.82	2 22.9	32	1 23 20.59	+10.879	+9 4 16.0	+74.65	2 36.2

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter .	5.84	5.93	6.03	6.14	6.24	6.37	6.50
Hor. Parallax .	6.05	6.15	6.25	6.35	6.47	6.59	6.73

Day of the Month.	5th.	10th.	15th.	20th.	25th.
	″	″	″	″	″
Semidiameter . .	6.63	6.78	6.95	7.12	7.31
Hor. Parallax . .	6.87	7.03	7.19	7.37	7.57

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	1 10 18.33	+10.853	+ 7 33 50.5	+76.01	2 35.0
2	1 14 38.88	10.860	8 4 9.8	75.59	2 35.4
3	1 18 59.62	10.869	8 34 18.5	75.14	2 35.8
4	1 23 20.59	10.879	9 4 16.0	74.65	2 36.2
5	1 27 41.81	10.890	9 34 1.4	74.13	2 36.6
6	1 32 3.29	+10.901	+10 3 34.2	+73.59	2 37.0
7	1 36 25.07	10.913	10 32 53.7	73.02	2 37.5
8	1 40 47.16	10.927	11 1 59.1	72.42	2 37.9
9	1 45 9.58	10.941	11 30 49.7	71.79	2 38.3
10	1 49 32.35	10.956	11 59 24.8	71.13	2 38.8
11	1 53 55.49	+10.972	+12 27 43.8	+70.45	2 39.2
12	1 58 19.02	10.989	12 55 45.9	69.74	2 39.7
13	2 2 42.96	11.006	13 23 30.5	69.00	2 40.1
14	2 7 7.31	11.024	13 50 57.0	68.22	2 40.6
15	2 11 32.10	11.042	14 18 4.7	67.42	2 41.0
16	2 15 57.34	+11.061	+14 44 53.0	+66.59	2 41.5
17	2 20 23.04	11.080	15 11 21.0	65.74	2 42.0
18	2 24 49.20	11.100	15 37 28.4	64.86	2 42.5
19	2 29 15.85	11.120	16 3 14.2	63.95	2 43.0
20	2 33 42.98	11.141	16 28 38.1	63.02	2 43.5
21	2 38 10.60	+11.162	+16 53 39.2	+62.06	2 44.0
22	2 42 38.72	11.183	17 18 17.0	61.08	2 44.6
23	2 47 7.33	11.203	17 42 30.9	60.07	2 45.1
24	2 51 36.44	11.224	18 6 20.3	59.04	2 45.7
25	2 56 6.05	11.244	18 29 44.6	57.98	2 46.2
26	3 0 36.14	+11.264	+18 52 43.1	+56.90	2 46.8
27	3 5 6.71	11.283	19 15 15.4	55.79	2 47.3
28	3 9 37.75	11.302	19 37 20.8	54.66	2 47.9
29	3 14 9.23	11.320	19 58 58.6	53.50	2 48.5
30	3 18 41.13	11.337	20 20 8.5	52.32	2 49.1
31	3 23 13.44	+11.353	+20 40 49.6	+51.12	2 49.7
32	3 27 46.11	+11.368	+21 1 1.6	+49.89	2 50.3

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 27 46.11	+11.368	+21 1 1.6	+49.89	2 50.3
2	3 32 19.12	11.382	21 20 43.9	48.64	2 50.9
3	3 36 52.44	11.394	21 39 56.1	47.37	2 51.5
4	3 41 26.02	11.404	21 58 37.7	46.09	2 52.1
5	3 45 59.82	11.412	22 16 48.1	44.79	2 52.7
6	3 50 33.79	+11.418	+22 34 26.8	+43.46	2 53.4
7	3 55 7.89	11.422	22 51 33.4	42.11	2 54.0
8	3 59 42.06	11.424	23 8 7.7	40.75	2 54.6
9	4 4 16.25	11.424	23 24 9.2	39.37	2 55.2
10	4 8 50.41	11.421	23 39 37.4	37.98	2 55.9
11	4 13 24.48	+11.416	+23 54 32.2	+36.58	2 56.5
12	4 17 58.40	11.409	24 8 53.0	35.16	2 57.1
13	4 22 32.10	11.398	24 22 39.7	33.73	2 57.7
14	4 27 5.53	11.385	24 35 52.0	32.29	2 58.4
15	4 31 38.62	11.369	24 48 29.7	30.84	2 59.0
16	4 36 11.29	+11.351	+25 0 32.5	+29.39	2 59.6
17	4 40 43.47	11.330	25 12 0.3	27.93	3 0.2
18	4 45 15.09	11.305	25 22 52.8	26.46	3 0.8
19	4 49 46.08	11.276	25 33 9.9	24.98	3 1.3
20	4 54 16.35	11.244	25 42 51.7	23.50	3 1.9
21	4 58 45.82	+11.209	+25 51 58.0	+22.02	3 2.4
22	5 3 14.41	11.171	26 0 28.6	20.53	3 3.0
23	5 7 42.03	11.129	26 8 23.6	19.05	3 3.5
24	5 12 8.60	11.083	26 15 43.2	17.57	3 4.0
25	5 16 34.02	11.033	26 22 27.3	16.10	3 4.5
26	5 20 58.19	+10.979	+26 28 35.9	+14.63	3 4.9
27	5 25 21.01	10.920	26 34 9.2	13.16	3 5.3
28	5 29 42.37	10.857	26 39 7.4	11.69	3 5.7
29	5 34 2.16	10.789	26 43 30.6	10.23	3 6.2
30	5 38 20.27	10.716	26 47 19.1	8.79	3 6.5
31	5 42 36.58	+10.639	+26 50 33.1	+ 7.37	3 6.8
32	5 46 50.96	+10.557	+26 53 12.9	+ 5.96	3 7.1

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . . .	7.52	7.75	7.99	8.25	8.54	8.86
Hor. Parallax . . .	7.78	8.00	8.27	8.54	8.85	9.18

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
	″	″	″	″	″	″
Semidiameter . . .	9.21	9.60	10.02	10.52	11.05	11.64
Hor. Parallax . . .	9.54	9.94	10.39	10.89	11.44	12.05

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	5 42 36.58	+10.639	+26 50 33.1	+ 7.37	3 6.8	1	7 27 41.37	+5.253	+24 33 10.9	−24.58	2 49.4
2	5 46 50.96	10.557	26 53 12.9	5.96	3 7.1	2	7 29 43.94	4.958	24 23 15.4	25.04	2 47.5
3	5 51 3.29	10.469	26 55 18.9	4.56	3 7.3	3	7 31 39.32	4.654	24 13 9.3	25.46	2 45.5
4	5 55 13.44	10.375	26 56 51.4	3.16	3 7.6	4	7 33 27.27	4.339	24 2 53.8	25.83	2 43.3
5	5 59 21.30	10.276	26 57 50.8	1.78	3 7.8	5	7 35 7.55	4.015	23 52 29.8	26.16	2 41.0
6	6 3 26.72	+10.172	+26 58 17.6	+ 0.43	3 7.9	6	7 36 39.93	+3.680	+23 41 58.3	−26.45	2 38.6
7	6 7 29.56	10.062	26 58 12.1	− 0.89	3 8.0	7	7 38 4.16	3.336	23 31 20.4	26.70	2 36.1
8	6 11 29.71	9.947	26 57 35.0	2.20	3 8.1	8	7 39 20.02	2.982	23 20 36.9	26.91	2 33.4
9	6 15 27.02	9.826	26 56 26.7	3.49	3 8.1	9	7 40 27.26	2.618	23 9 48.8	27.09	2 30.6
10	6 19 21.36	9.699	26 54 47.7	4.76	3 8.0	10	7 41 25.63	2.245	22 58 57.0	27.23	2 27.6
11	6 23 12.58	+ 9.567	+26 52 38.6	− 6.00	3 7.9	11	7 42 14.93	+1.862	+22 48 2.5	−27.33	2 24.5
12	6 27 0.55	9.429	26 50 0.1	7.21	3 7.8	12	7 42 54.96	1.471	22 37 6.0	27.38	2 21.2
13	6 30 45.13	9.284	26 46 52.8	8.39	3 7.6	13	7 43 25.49	1.071	22 26 8.4	27.41	2 17.7
14	6 34 26.17	9.133	26 43 17.4	9.55	3 7.3	14	7 43 46.35	0.665	22 15 10.4	27.41	2 14.1
15	6 38 3.52	8.976	26 39 14.5	10.68	3 7.0	15	7 43 57.38	+0.252	22 4 12.7	27.39	2 10.4
16	6 41 37.04	+ 8.814	+26 34 44.8	−11.78	3 6.6	16	7 43 58.43	−0.167	+21 53 16.0	−27.34	2 6.5
17	6 45 6.59	8.646	26 29 49.1	12.85	3 6.1	17	7 43 49.39	0.589	21 42 21.0	27.26	2 2.4
18	6 48 32.00	8.471	26 24 28.1	13.89	3 5.6	18	7 43 30.18	1.014	21 31 28.3	27.14	1 58.1
19	6 51 53.14	8.288	26 18 42.6	14.90	3 5.0	19	7 43 0.74	1.440	21 20 38.4	27.00	1 53.7
20	6 55 9.85	8.100	26 12 33.3	15.87	3 4.3	20	7 42 21.07	1.866	21 9 51.9	26.85	1 49.1
21	6 58 21.97	+ 7.905	+26 6 1.2	−16.81	3 3.6	21	7 41 31.17	−2.291	+20 59 9.4	−26.68	1 44.3
22	7 1 29.32	7.704	25 59 7.0	17.71	3 2.7	22	7 40 31.11	2.712	20 48 31.4	26.49	1 39.4
23	7 4 31.75	7.496	25 51 51.5	18.58	3 1.8	23	7 39 21.01	3.127	20 37 58.3	26.27	1 34.3
24	7 7 29.09	7.280	25 44 15.7	19.41	3 0.8	24	7 38 1.05	3.534	20 27 30.7	26.03	1 29.0
25	7 10 21.15	7.056	25 36 20.4	20.19	2 59.8	25	7 36 31.45	3.929	20 17 9.1	25.77	1 23.5
26	7 13 7.76	+ 6.824	+25 28 6.8	−20.94	2 58.6	26	7 34 52.51	−4.311	+20 6 54.0	−25.48	1 17.9
27	7 15 48.72	6.584	25 19 35.5	21.65	2 57.3	27	7 33 4.57	4.677	19 56 46.1	25.17	1 12.2
28	7 18 23.81	6.337	25 10 47.7	22.32	2 55.9	28	7 31 8.09	5.023	19 46 45.8	24.84	1 6.3
29	7 20 52.85	6.081	25 1 44.3	22.95	2 54.5	29	7 29 3.55	5.346	19 36 53.7	24.48	1 0.3
30	7 23 15.60	5.815	24 52 26.4	23.54	2 52.9	30	7 26 51.56	5.644	19 27 10.5	24.10	0 54.2
31	7 25 31.85	+ 5.538	+24 42 54.9	−24.08	2 51.2	31	7 24 32.74	−5.913	+19 17 36.9	−23.69	0 48.0
32	7 27 41.37	+ 5.253	+24 33 10.9	−24.58	2 49.4	32	7 22 7.85	−6.150	+19 8 13.8	−23.24	0 41.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter .	12.31	13.07	13.91	14.87	15.95	17.17	18.56
Hor. Parallax .	12.75	13.52	14.40	15.39	16.51	17.78	19.21

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . . .	20.09	21.79	23.60	25.45	27.15	28.54
Hor. Parallax . . .	20.81	22.56	24.42	26.35	28.11	29.55

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	7 24 32.74	−5.913	+19 17 36.9	−23.69	0 48.0	1	6 31 38.69	+0.951	+16 59 54.9	+3.34	21 49.9
2	7 22 7.85	6.150	19 8 13.8	23.24	0 41.7	2	6 32 6.12	1.332	17 1 22.6	3.95	21 46.6
3	7 19 37.66	6.353	18 59 1.8	22.75	0 35.3	3	6 32 42.60	1.705	17 3 4.0	4.50	21 43.4
4	7 17 3.05	6.519	18 50 2.1	22.22	0 28.8	4	6 33 27.92	2.069	17 4 57.3	4.97	21 40.3
5	7 14 24.94	6.644	18 41 15.4	21.65	0 22.2	5	6 34 21.85	2.423	17 7 1.4	5.36	21 37.4
6	7 11 44.28	−6.730	+18 32 42.9	−21.04	0 15.6	6	6 35 24.19	+2.768	+17 9 14.3	+5.69	21 34.6
7	7 9 2.04	6.775	18 24 25.7	20.38	0 9.0	7	6 36 34.69	3.104	17 11 34.4	5.96	21 32.0
8	7 6 19.24	6.776	18 16 24.9	19.67	0 2.4 23 55.8	8	6 37 53.14	3.430	17 14 0.3	6.17	21 29.5
9	7 3 36.93	6.735	18 8 41.8	18.91	23 49.2	9	6 39 19.30	3.747	17 16 30.3	6.31	21 27.1
10	7 0 56.10	6.652	18 1 17.7	18.10	23 42.6	10	6 40 52.95	4.054	17 19 2.7	6.38	21 24.8
11	6 58 17.71	−6.531	+17 54 13.7	−17.24	23 36.1	11	6 42 33.86	+4.352	+17 21 36.0	+6.39	21 22.7
12	6 55 42.75	6.368	17 47 30.8	16.33	23 29.7	12	6 44 21.80	4.640	17 24 8.8	6.33	21 20.6
13	6 53 12.21	6.167	17 41 10.3	15.38	23 23.4	13	6 46 16.54	4.919	17 26 39.5	6.21	21 18.7
14	6 50 46.93	5.929	17 35 13.1	14.39	23 17.1	14	6 48 17.86	5.188	17 29 6.6	6.04	21 16.9
15	6 48 27.75	5.660	17 29 40.2	13.35	23 11.0	15	6 50 25.52	5.448	17 31 28.9	5.81	21 15.1
16	6 46 15.38	−5.361	+17 24 32.5	−12.29	23 5.0	16	6 52 39.30	+5.698	+17 33 44.8	+5.52	21 13.5
17	6 44 10.52	5.037	17 19 50.6	11.21	22 59.1	17	6 54 58.99	5.939	17 35 53.0	5.17	21 12.0
18	6 42 13.71	4.690	17 15 35.0	10.10	22 53.4	18	6 57 24.36	6.171	17 37 52.4	4.77	21 10.6
19	6 40 25.49	4.323	17 11 46.0	8.98	22 47.8	19	6 59 55.19	6.395	17 39 41.6	4.32	21 9.2
20	6 38 46.27	3.941	17 8 23.7	7.87	22 42.4	20	7 2 31.27	6.610	17 41 19.5	5.83	21 8.0
21	6 37 16.39	−3.546	+17 5 28.2	− 6.76	22 37.1	21	7 5 12.40	+6.816	+17 42 45.0	+3.29	21 6.8
22	6 35 56.12	3.141	17 2 59.1	5.66	22 32.0	22	7 7 58.38	7.014	17 43 57.2	2.71	21 5.7
23	6 34 45.65	2.730	17 0 56.3	4.58	22 27.1	23	7 10 49.03	7.204	17 44 54.8	2.08	21 4.7
24	6 33 45.12	2.313	16 59 19.1	3.53	22 22.3	24	7 13 44.14	7.387	17 45 37.0	1.41	21 3.7
25	6 32 54.62	1.895	16 58 7.0	2.51	22 17.7	25	7 16 43.56	7.562	17 46 2.6	+0.71	21 2.8
26	6 32 14.15	−1.478	+16 57 18.9	− 1.52	22 13.2	26	7 19 47.10	+7.730	+17 46 10.8	−0.03	21 1.9
27	6 31 43.69	1.061	16 56 54.1	− 0.57	22 8.9	27	7 22 54.60	7.892	17 46 0.8	0.81	21 1.1
28	6 31 23.23	0.647	16 56 51.2	+ 0.33	22 4.8	28	7 26 5.90	8.047	17 45 31.7	1.62	21 0.4
29	6 31 12.63	−0.238	16 57 9.2	1.17	22 0.8	29	7 29 20.85	8.196	17 44 42.8	2.46	20 59.8
30	6 31 11.77	+0.165	16 57 46.8	1.95	21 57.0	30	7 32 39.30	8.339	17 43 33.1	3.33	20 59.2
31	6 31 20.52	+0.562	+16 58 42.5	+ 2.67	21 53.4	31	7 36 1.09	+8.476	+17 42 2.1	−4.24	20 58.7
32	6 31 38.69	+0.951	+16 59 54.9	+ 3.34	21 49.9	32	7 39 26.11	+8.607	+17 40 9.0	−5.18	20 58.3

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . . .	29.33	29.41	28.69	27.42	25.75	23.98	Semidiameter . . .	22.19	20.51	18.97	17.59	16.36	15.28
Hor. Parallax . . .	30.37	30.45	29.71	28.39	26.67	24.82	Hor. Parallax . . .	22.97	21.23	19.64	18.21	16.94	15.81

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	7 39 26.11	+ 8.607	+17 40 9.0	− 5.18	20 58.3
2	7 42 54.21	8.733	17 37 53.1	6.14	20 57.8
3	7 46 25.27	8.854	17 35 14.0	7.13	20 57.4
4	7 49 59.16	8.970	17 32 10.9	8.14	20 57.1
5	7 53 35.76	9.081	17 28 43.2	9.17	20 56.8
6	7 57 14.97	+ 9.186	+17 24 50.5	−10.22	20 56.5
7	8 0 56.66	9.287	17 20 32.2	11.30	20 56.3
8	8 4 40.74	9.384	17 15 48.0	12.39	20 56.1
9	8 8 27.10	9.477	17 10 37.4	13.50	20 56.0
10	8 12 15.65	9.566	17 5 0.0	14.62	20 55.9
11	8 16 6.28	+ 9.651	+16 58 55.6	−15.75	20 55.8
12	8 19 58.89	9.731	16 52 23.8	16.90	20 55.8
13	8 23 53.38	9.807	16 45 24.3	18.06	20 55.8
14	8 27 49.65	9.879	16 37 57.1	19.22	20 55.8
15	8 31 47.61	9.948	16 30 1.8	20.39	20 55.8
16	8 35 47.16	+10.013	+16 21 38.4	−21.56	20 55.9
17	8 39 48.21	10.074	16 12 46.9	22.73	20 56.0
18	8 43 50.68	10.131	16 3 27.2	23.91	20 56.1
19	8 47 54.48	10.185	15 53 39.1	25.09	20 56.3
20	8 51 59.52	10.235	15 43 22.8	26.27	20 56.5
21	8 56 5.73	+10.282	+15 32 38.3	−27.44	20 56.6
22	9 0 13.04	10.326	15 21 25.7	28.61	20 56.8
23	9 4 21.37	10.367	15 9 45.0	29.78	20 57.0
24	9 8 30.65	10.405	14 57 36.3	30.94	20 57.3
25	9 12 40.82	10.441	14 44 59.8	32.10	20 57.5
26	9 16 51.82	+10.474	+14 31 55.6	−33.25	20 57.7
27	9 21 3.59	10.505	14 18 24.1	34.39	20 58.0
28	9 25 16.07	10.534	14 4 25.1	35.52	20 58.3
29	9 29 29.22	10.561	13 49 59.1	36.64	20 58.6
30	9 33 42.98	10.585	13 35 6.2	37.75	20 58.9
31	9 37 57.31	+10.608	+13 19 46.8	−38.86	20 59.1
32	9 42 12.17	+10.629	+13 4 1.0	−39.95	20 59.5

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	9 37 57.31	+10.608	+13 19 46.8	−38.86	20 59.2
2	9 42 12.17	10.629	13 4 1.0	39.95	20 59.5
3	9 46 27.51	10.649	12 47 49.3	41.03	20 59.8
4	9 50 43.31	10.667	12 31 12.0	42.09	21 0.1
5	9 54 59.54	10.684	12 14 9.1	43.14	21 0.5
6	9 59 16.17	+10.700	+11 56 41.2	−44.18	21 0.8
7	10 3 33.16	10.715	11 38 48.6	45.20	21 1.2
8	10 7 50.50	10.729	11 20 31.7	46.20	21 1.5
9	10 12 8.16	10.742	11 1 50.9	47.19	21 1.9
10	10 16 26.12	10.754	10 42 46.6	48.16	21 2.2
11	10 20 44.36	+10.765	+10 23 19.2	−49.11	21 2.6
12	10 25 2.86	10.776	10 3 29.3	50.04	21 3.0
13	10 29 21.60	10.786	9 43 17.3	50.95	21 3.3
14	10 33 40.57	10.795	9 22 43.8	51.84	21 3.7
15	10 37 59.75	10.803	9 1 49.2	52.71	21 4.1
16	10 42 19.12	+10.811	+ 8 40 34.1	−53.55	21 4.5
17	10 46 38.67	10.818	8 18 59.1	54.37	21 4.9
18	10 50 58.40	10.825	7 57 4.8	55.16	21 5.2
19	10 55 18.28	10.832	7 34 51.7	55.93	21 5.6
20	10 59 38.32	10.838	7 12 20.4	56.68	21 6.0
21	11 3 58.50	+10.844	+ 6 49 31.5	−57.40	21 6.4
22	11 8 18.83	10.850	6 26 25.6	58.09	21 6.8
23	11 12 39.30	10.856	6 3 3.4	58.76	21 7.2
24	11 16 59.91	10.862	5 39 25.5	59.40	21 7.6
25	11 21 20.68	10.868	5 15 32.4	60.02	21 8.0
26	11 25 41.60	+10.875	+ 4 51 24.8	−60.61	21 8.4
27	11 30 2.68	10.882	4 27 3.3	61.17	21 8.8
28	11 34 23.93	10.889	4 2 28.6	61.71	21 9.3
29	11 38 45.35	10.897	3 37 41.3	62.23	21 9.7
30	11 43 6.97	10.905	3 12 42.1	62.72	21 10.1
31	11 47 28.79	+10.914	+ 2 47 31.5	−63.17	21 10.5
32	11 51 50.84	+10.924	+ 2 22 10.4	−63.60	21 11.0

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter . . .	14.31	13.45	12.69	12.00	11.40	10.84
Hor. Parallax . . .	14.82	13.97	13.13	12.43	11.79	11.23

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter . . .	10.35	9.90	9.50	9.13	8.79	8.48
Hor. Parallax . . .	10.72	10.26	9.83	9.45	9.10	8.78

Note.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	11 51 50.84	+10.924	+ 2 22 10.4	−63.60	21 11.0
2	11 56 13.12	10.934	1 56 39.2	64.00	21 11.4
3	12 0 35.67	10.945	1 30 58.7	64.38	21 11.8
4	12 4 58.50	10.957	1 5 9.4	64.73	21 12.3
5	12 9 21.63	10.970	0 39 12.1	65.05	21 12.7
6	12 13 45.08	+10.984	+ 0 13 7.5	−65.34	21 13.2
7	12 18 8.89	10.999	− 0 13 3.7	65.60	21 13.7
8	12 22 33.08	11.016	0 39 21.0	65.83	21 14.1
9	12 26 57.67	11.034	1 5 43.5	66.04	21 14.6
10	12 31 22.69	11.052	1 32 10.6	66.21	21 15.1
11	12 35 48.15	+11.071	− 1 58 41.5	−66.35	21 15.5
12	12 40 14.09	11.091	2 25 15.5	66.47	21 16.0
13	12 44 40.53	11.112	2 51 51.8	66.55	21 16.6
14	12 49 7.48	11.134	3 18 29.7	66.60	21 17.1
15	12 53 34.97	11.157	3 45 8.5	66.62	21 17.6
16	12 58 3.03	+11.181	− 4 11 47.3	−66.61	21 18.1
17	13 2 31.68	11.206	4 38 25.4	66.57	21 18.7
18	13 7 0.94	11.232	5 5 2.1	66.49	21 19.2
19	13 11 30.84	11.259	5 31 36.6	66.38	21 19.8
20	13 16 1.40	11.287	5 58 8.1	66.24	21 20.4
21	13 20 32.64	+11.316	− 6 24 35.9	−66.07	21 20.9
22	13 25 4.60	11.346	6 50 59.2	65.86	21 21.5
23	13 29 37.29	11.378	7 17 17.1	65.62	21 22.1
24	13 34 10.74	11.410	7 43 28.8	65.35	21 22.8
25	13 38 44.97	11.443	8 9 33.7	65.05	21 23.4
26	13 43 20.01	+11.477	− 8 35 31.0	−64.72	21 24.1
27	13 47 55.89	11.512	9 1 19.9	64.35	21 24.7
28	13 52 32.62	11.548	9 26 59.6	63.95	21 25.4
29	13 57 10.24	11.586	9 52 29.2	63.52	21 26.1
30	14 1 48.77	11.625	10 17 48.2	63.05	21 26.8
31	14 6 28.23	+11.665	−10 42 55.6	−62.55	21 27.6
32	14 11 8.66	+11.705	−11 7 50.7	−62.02	21 28.3

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	14 6 28.23	+11.665	−10 42 55.6	−62.55	21 27.6
2	14 11 8.66	11.705	11 7 50.7	62.02	21 28.3
3	14 15 50.08	11.746	11 32 32.7	61.47	21 29.1
4	14 20 32.51	11.789	11 57 0.8	60.88	21 29.9
5	14 25 15.98	11.833	12 21 14.3	60.25	21 30.7
6	14 30 0.51	+11.878	−12 45 12.2	−59.58	21 31.5
7	14 34 46.13	11.924	13 8 54.0	58.88	21 32.3
8	14 39 32.85	11.970	13 32 18.7	58.15	21 33.2
9	14 44 20.69	12.017	13 55 25.5	57.40	21 34.0
10	14 49 9.67	12.065	14 18 13.6	56.61	21 34.9
11	14 53 59.81	+12.114	−14 40 42.3	−55.78	21 35.8
12	14 58 51.11	12.163	15 2 50.7	54.92	21 36.8
13	15 3 43.58	12.212	15 24 38.0	54.02	21 37.7
14	15 8 37.24	12.261	15 46 3.4	53.09	21 38.7
15	15 13 32.08	12.310	16 7 6.1	52.13	21 39.7
16	15 18 28.12	+12.360	−16 27 45.4	−51.13	21 40.7
17	15 23 25.36	12.410	16 48 0.3	50.10	21 41.7
18	15 28 23.79	12.460	17 7 50.2	49.04	21 42.8
19	15 33 23.42	12.510	17 27 14.3	47.95	21 43.9
20	15 38 24.24	12.559	17 46 11.8	46.83	21 44.9
21	15 43 26.24	+12.608	−18 4 41.9	−45.67	21 46.1
22	15 48 29.41	12.657	18 22 43.9	44.48	21 47.2
23	15 53 33.75	12.705	18 40 17.1	43.26	21 48.3
24	15 58 39.24	12.753	18 57 20.6	42.02	21 49.5
25	16 3 45.87	12.800	19 13 53.9	40.75	21 50.7
26	16 8 53.62	+12.846	−19 29 56.2	−39.45	21 51.9
27	16 14 2.47	12.891	19 45 26.8	38.11	21 53.1
28	16 19 12.40	12.936	20 0 25.1	36.74	21 54.3
29	16 24 23.39	12.980	20 14 50.4	35.35	21 55.6
30	16 29 35.42	13.023	20 28 42.0	33.94	21 56.9
31	16 34 48.47	+13.064	−20 41 59.4	−32.50	21 58.2
32	16 40 2.51	+13.105	−20 54 41.9	−31.04	21 59.5

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . . .	8.20	7.94	7.70	7.48	7.28	7.09
Hor. Parallax . . .	8.49	8.22	7.97	7.74	7.53	7.34

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″	″
Semidiameter .	6.92	6.76	6.60	6.46	6.33	6.21	6.10
Hor. Parallax .	7.16	6.99	6.84	6.69	6.56	6.43	6.32

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	19 2 20.40	+8.368	−23 36 42.2	+11.52	0 19.6	1	20 44 27.00	+8.032	−19 11 44.9	+30.46	23 58.8
2	19 5 41.20	8.365	23 31 57.7	12.19	0 19.0	2	20 47 39.57	8.015	18 59 27.8	30.98	23 58.0
3	19 9 1.92	8.361	23 26 57.1	12.86	0 18.4	3	20 50 51.74	7.998	18 46 58.4	31.49	23 57.3
4	19 12 22.55	8.357	23 21 40.5	13.52	0 17.8	4	20 54 3.49	7.981	18 34 16.8	31.98	23 56.6
5	19 15 43.05	8.352	23 16 8.1	14.18	0 17.2	5	20 57 14.83	7.964	18 21 23.3	32.47	23 55.8
6	19 19 3.43	+8.346	−23 10 19.8	+14.84	0 16.6	6	21 0 25.74	+7.946	−18 8 18.0	+32.95	23 55.0
7	19 22 23.65	8.340	23 4 15.7	15.50	0 16.0	7	21 3 36.23	7.928	17 55 1.0	33.43	23 54.2
8	19 25 43.71	8.333	22 57 55.8	16.15	0 15.4	8	21 6 46.29	7.910	17 41 32.6	33.91	23 53.4
9	19 29 3.58	8.325	22 51 20.3	16.80	0 14.8	9	21 9 55.92	7.892	17 27 53.0	34.38	23 52.6
10	19 32 23.27	8.316	22 44 29.3	17.45	0 14.2	10	21 13 5.12	7.874	17 14 2.3	34.84	23 51.8
11	19 35 42.75	+8.307	−22 37 22.8	+18.09	0 13.6	11	21 16 13.89	+7.857	−17 0 0.7	+35.29	23 51.0
12	19 39 2.01	8.298	22 30 1.0	18.73	0 13.0	12	21 19 22.23	7.839	16 45 48.4	35.73	23 50.2
13	19 42 21.05	8.288	22 22 23.9	19.36	0 12.3	13	21 22 30.14	7.821	16 31 25.5	36.17	23 49.4
14	19 45 39.85	8.278	22 14 31.5	19.99	0 11.7	14	21 25 37.62	7.803	16 16 52.3	36.60	23 48.6
15	19 48 58.40	8.268	22 6 24.1	20.62	0 11.0	15	21 28 44.67	7.785	16 2 8.9	37.02	23 47.7
16	19 52 16.70	+8.257	−21 58 1.6	+21.24	0 10.4	16	21 31 51.30	+7.767	−15 47 15.6	+37.43	23 46.9
17	19 55 34.73	8.245	21 49 24.2	21.86	0 9.7	17	21 34 57.50	7.749	15 32 12.5	37.83	23 46.0
18	19 58 52.48	8.233	21 40 32.1	22.47	0 9.1	18	21 38 3.28	7.732	15 16 59.8	38.22	23 45.2
19	20 2 9.94	8.221	21 31 25.3	23.08	0 8.4	19	21 41 8.65	7.715	15 1 37.7	38.61	23 44.3
20	20 5 27.11	8.209	21 22 4.0	23.69	0 7.8	20	21 44 13.60	7.697	14 46 6.5	38.99	23 43.5
21	20 8 43.98	+8.196	−21 12 28.3	+24.29	0 7.1	21	21 47 18.13	+7.680	−14 30 26.3	+39.36	23 42.6
22	20 12 0.53	8.183	21 2 38.3	24.88	0 6.5	22	21 50 22.25	7.663	14 14 37.3	39.72	23 41.8
23	20 15 16.75	8.169	20 52 34.1	25.47	0 5.8	23	21 53 25.96	7.646	13 58 39.7	40.07	23 40.9
24	20 18 32.65	8.155	20 42 15.9	26.05	0 5.2	24	21 56 29.27	7.629	13 42 33.7	40.42	23 40.0
25	20 21 48.21	8.141	20 31 44.0	26.62	0 4.5	25	21 59 32.17	7.612	13 26 19.6	40.76	23 39.1
26	20 25 3.43	+8.126	−20 20 58.2	+27.18	0 3.8	26	22 2 34.66	+7.595	−13 9 57.5	+41.09	23 38.2
27	20 28 18.29	8.111	20 9 59.0	27.74	0 3.1	27	22 5 36.76	7.578	12 53 27.7	41.41	23 37.3
28	20 31 32.79	8.096	19 58 46.2	28.29	0 2.4	28	22 8 38.46	7.562	12 36 50.3	41.72	23 36.3
29	20 34 46.92	8.081	19 47 20.4	28.84	0 1.7	29	22 11 39.76	7.546	12 20 5.7	42.02	23 35.4
30	20 38 0.67	8.065	19 35 41.3	29.39	0 1.0	30	22 14 40.67	7.529	12 3 14.0	42.31	23 34.4
31	20 41 14.03	+8.049	−19 23 49.5	+29.93	0 0.3 23 59.6	31	22 17 41.18	+7.513	−11 46 15.4	+42.59	23 33.5
32	20 44 27.00	+8.032	−19 11 44.9	+30.46	23 58.8	32	22 20 41.31	+7.497	−11 29 10.2	+42.86	23 32.5

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.	Day of the Month.	5th.	10th.	15th.	20th.	25th.
	″	″	″	″	″	″	″		″	″	″	″	″
Semidiameter .	2.10	2.10	2.11	2.11	2.12	2.12	2.12	Semidiameter	2.13	2.13	2.14	2.14	2.14
Hor. Parallax .	3.68	3.68	3.69	3.69	3.70	3.71	3.72	Hor. Parallax	3.72	3.73	3.74	3.75	3.76

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	22 11 39.76	+7.546	−12 20 5.7	+42.08	23 35.4	1	23 42 32.20	+7.159	−2 59 29.7	+47.07	23 4.0
2	22 14 40.67	7.529	12 3 14.0	42.31	23 34.4	2	23 45 23.92	7.151	2 40 39.7	47.10	23 2.9
3	22 17 41.18	7.513	11 46 15.4	42.59	23 33.5	3	23 48 15.45	7.143	2 21 49.1	47.12	23 1.8
4	22 20 41.31	7.497	11 29 10.2	42.86	23 32.5	4	23 51 6.80	7.136	2 2 58.1	47.13	23 0.7
5	22 23 41.05	7.481	11 11 58.6	43.12	23 31.6	5	23 53 57.98	7.129	1 44 7.0	47.13	22 59.6
6	22 26 40.41	+7.465	−10 54 40.8	+43.37	23 30.6	6	23 56 49.00	+7.123	−1 25 15.8	+47.13	22 58.5
7	22 29 39.39	7.449	10 37 16.9	43.61	23 29.7	7	23 59 39.86	7.117	1 6 24.8	47.12	22 57.4
8	22 32 38.00	7.434	10 19 47.3	43.85	23 28.7	8	0 2 30.58	7.111	0 47 34.1	47.10	22 56.3
9	22 35 36.24	7.419	10 2 12.0	44.08	23 27.7	9	0 5 21.15	7.105	0 28 44.0	47.07	22 55.2
10	22 38 34.13	7.404	9 44 31.3	44.30	23 26.8	10	0 8 11.60	7.100	−0 9 54.7	47.04	22 54.1
11	22 41 31.66	+7.390	− 9 26 45.4	+44.52	23 25.8	11	0 11 1.93	+7.095	+0 8 53.7	+47.00	22 53.0
12	22 44 28.85	7.376	9 8 54.5	44.73	23 24.8	12	0 13 52.14	7.091	0 27 41.1	46.95	22 51.9
13	22 47 25.70	7.362	8 50 58.8	44.93	23 23.8	13	0 16 42.25	7.087	0 46 27.2	46.89	22 50.8
14	22 50 22.22	7.348	8 32 58.5	45.12	23 22.8	14	0 19 32.27	7.083	1 5 11.9	46.83	22 49.7
15	22 53 18.41	7.335	8 14 53.8	45.30	23 21.8	15	0 22 22.21	7.079	1 23 54.9	46.76	22 48.6
16	22 56 14.29	+7.322	− 7 56 44.9	+45.46	23 20.8	16	0 25 12.07	+7.076	+1 42 36.2	+46.68	22 47.5
17	22 59 9.87	7.309	7 38 31.9	45.61	23 19.8	17	0 28 1.87	7.074	2 1 15.5	46.59	22 46.4
18	23 2 5.15	7.297	7 20 15.1	45.76	23 18.8	18	0 30 51.61	7.072	2 19 52.7	46.50	22 45.3
19	23 5 0.14	7.285	7 1 54.7	45.91	23 17.8	19	0 33 41.30	7.070	2 38 27.6	46.40	22 44.1
20	23 7 54.85	7.273	6 43 30.8	46.05	23 16.7	20	0 36 30.96	7.068	2 57 0.0	46.30	22 43.0
21	23 10 49.28	+7.262	− 6 25 3.7	+46.19	23 15.6	21	0 39 20.58	+7.067	+3 15 29.8	+46.19	22 41.9
22	23 13 43.45	7.251	6 6 33.6	46.32	23 14.6	22	0 42 10.17	7.066	3 33 56.7	46.07	22 40.8
23	23 16 37.36	7.241	5 48 0.6	46.44	23 13.5	23	0 44 59.75	7.066	3 52 20.5	45.94	22 39.7
24	23 19 31.03	7.231	5 29 25.0	46.55	23 12.5	24	0 47 49.32	7.065	4 10 41.3	45.80	22 38.5
25	23 22 24.45	7.221	5 10 46.9	46.64	23 11.4	25	0 50 38.89	7.065	4 28 58.6	45.65	22 37.4
26	23 25 17.64	+7.211	− 4 52 6.6	+46.72	23 10.3	26	0 53 28.46	+7.065	+4 47 12.4	+45.49	22 36.3
27	23 28 10.60	7.202	4 33 24.3	46.79	23 9.3	27	0 56 18.03	7.066	5 5 22.5	45.33	22 35.2
28	23 31 3.34	7.193	4 14 40.2	46.86	23 8.2	28	0 59 7.62	7.066	5 23 28.6	45.16	22 34.1
29	23 33 55.86	7.184	3 55 54.4	46.92	23 7.2	29	1 1 57.22	7.067	5 41 30.6	44.99	22 32.9
30	23 36 48.18	7.175	3 37 7.3	46.98	23 6.1	30	1 4 46.85	7.068	5 59 28.3	44.81	22 31.8
31	23 39 40.29	+7.167	− 3 18 19.0	+47.03	23 5.1	31	1 7 36.50	+7.069	+6 17 21.5	+44.62	22 30.7
32	23 42 32.20	+7.159	− 2 59 29.7	+47.07	23 4.0	32	1 10 26.17	+7.070	+6 35 10.1	+44.42	22 29.6

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . . .	2.15	2.15	2.16	2.16	2.17	2.18	Semidiameter . . .	2.19	2.19	2.20	2.20	2.21	2.21
Hor. Parallax . . .	3.77	3.78	3.79	3.79	3.80	3.81	Hor. Parallax . . .	3.82	3.84	3.85	3.86	3.87	3.88

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	1 7 36.50	+7.069	+ 6 17 21.5	+44.62	22 30.7	1	2 35 58.82	+7.212	+14 40 58.1	+35.63	21 56.9
2	1 10 26.17	7.070	6 35 10.1	44.42	22 29.6	2	2 38 51.99	7.218	14 55 8.6	35.25	21 55.9
3	1 13 15.88	7.072	6 52 53.9	44.22	22 28.5	3	2 41 45.31	7.225	15 9 9.8	34.86	21 54.8
4	1 16 5.64	7.074	7 10 32.8	44.01	22 27.4	4	2 44 38.78	7.231	15 23 1.6	34.46	21 53.8
5	1 18 55.44	7.076	7 28 6.5	43.80	22 26.2	5	2 47 32.40	7.237	15 36 44.0	34.06	21 52.7
6	1 21 45.29	+7.078	+ 7 45 35.0	+43.58	22 25.1	6	2 50 26.17	+7.243	+15 50 16.7	+33.65	21 51.7
7	1 24 35.20	7.081	8 2 58.0	43.35	22 24.0	7	2 53 20.10	7.250	16 3 39.7	33.24	21 50.6
8	1 27 25.18	7.084	8 20 15.5	43.11	22 22.9	8	2 56 14.18	7.256	16 16 52.8	32.83	21 49.6
9	1 30 15.23	7.087	8 37 27.2	42.87	22 21.8	9	2 59 8.42	7.263	16 29 56.0	32.42	21 48.5
10	1 33 5.36	7.090	8 54 33.1	42.62	22 20.7	10	3 2 2.81	7.269	16 42 49.1	32.00	21 47.5
11	1 35 55.57	+7.094	+ 9 11 32.9	+42.36	22 19.6	11	3 4 57.35	+7.275	+16 55 32.1	+31.58	21 46.5
12	1 38 45.88	7.098	9 28 26.5	42.10	22 18.5	12	3 7 52.05	7.282	17 8 4.8	31.15	21 45.5
13	1 41 36.28	7.102	9 45 13.8	41.83	22 17.4	13	3 10 46.91	7.288	17 20 27.2	30.72	21 44.5
14	1 44 26.79	7.106	10 1 54.6	41.56	22 16.3	14	3 13 41.92	7.295	17 32 39.1	30.28	21 43.4
15	1 47 17.41	7.111	10 18 28.8	41.29	22 15.3	15	3 16 37.09	7.301	17 44 40.4	29.84	21 42.4
16	1 50 8.14	+7.116	+10 34 56.3	+41.01	22 14.2	16	3 19 32.42	+7.308	+17 56 31.1	+29.39	21 41.4
17	1 52 59.00	7.121	10 51 16.9	40.72	22 13.1	17	3 22 27.91	7.314	18 8 11.0	28.94	21 40.4
18	1 55 49.98	7.126	11 7 30.4	40.42	22 12.0	18	3 25 23.54	7.321	18 19 40.1	28.49	21 39.4
19	1 58 41.10	7.132	11 23 36.7	40.11	22 10.9	19	3 28 19.33	7.327	18 30 58.3	28.03	21 38.4
20	2 1 32.35	7.138	11 39 35.7	39.80	22 9.9	20	3 31 15.25	7.333	18 42 5.4	27.57	21 37.4
21	2 4 23.75	+7.144	+11 55 27.2	+39.48	22 8.8	21	3 34 11.32	+7.339	+18 53 1.4	+27.10	21 36.4
22	2 7 15.29	7.150	12 11 11.0	39.16	22 7.7	22	3 37 7.52	7.345	19 3 46.2	26.63	21 35.4
23	2 10 6.97	7.156	12 26 47.1	38.83	22 6.6	23	3 40 3.85	7.350	19 14 19.7	26.16	21 34.4
24	2 12 58.80	7.162	12 42 15.3	38.50	22 5.5	24	3 43 0.31	7.355	19 24 41.8	25.68	21 33.4
25	2 15 50.78	7.169	12 57 35.4	38.16	22 4.5	25	3 45 56.87	7.360	19 34 52.4	25.20	21 32.4
26	2 18 42.91	+7.175	+13 12 47.2	+37.81	22 3.4	26	3 48 53.54	+7.364	+19 44 51.5	+24.72	21 31.4
27	2 21 35.19	7.182	13 27 50.7	37.46	22 2.3	27	3 51 50.32	7.368	19 54 39.0	24.23	21 30.4
28	2 24 27.62	7.188	13 42 45.7	37.10	22 1.2	28	3 54 47.18	7.372	20 4 14.8	23.74	21 29.4
29	2 27 20.20	7.194	13 57 32.1	36.74	22 0.1	29	3 57 44.13	7.375	20 13 38.8	23.25	21 28.4
30	2 30 12.92	7.200	14 12 9.7	36.38	21 59.0	30	4 0 41.16	7.378	20 22 51.0	22.76	21 27.4
31	2 33 5.79	+7.206	+14 26 38.4	+36.01	21 58.0	31	4 3 38.27	+7.381	+20 31 51.3	+22.26	21 26.4
32	2 35 58.82	+7.212	+14 40 58.1	+35.63	21 56.9	32	4 6 35.44	+7.384	+20 40 39.7	+21.76	21 25.4

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter .	2.22	2.23	2.24	2.25	2.26	2.27	2.28
Hor. Parallax .	3.90	3.91	3.92	3.93	3.95	3.97	3.99

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . . .	2.29	2.30	2.31	2.33	2.34	2.35
Hor. Parallax . . .	4.00	4.02	4.04	4.07	4.09	4.12

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	4 3 38.27	+7.381	+20 31 51.3	+22.26	21 26.4
2	4 6 35.44	7.384	20 40 39.7	21.76	21 25.4
3	4 9 32.68	7.386	20 49 16.1	21.26	21 24.4
4	4 12 29.96	7.388	20 57 40.4	20.76	21 23.5
5	4 15 27.30	7.390	21 5 52.7	20.26	21 22.5
6	4 18 24.68	+7.392	+21 13 52.8	+19.75	21 21.5
7	4 21 22.10	7.393	21 21 40.8	19.24	21 20.5
8	4 24 19.54	7.394	21 29 16.5	18.73	21 19.5
9	4 27 17.00	7.395	21 36 40.0	18.22	21 18.6
10	4 30 14.48	7.395	21 43 51.2	17.71	21 17.6
11	4 33 11.98	+7.395	+21 50 50.2	+17.20	21 16.6
12	4 36 9.48	7.396	21 57 36.8	16.68	21 15.6
13	4 39 6.99	7.396	22 4 11.0	16.17	21 14.6
14	4 42 4.50	7.396	22 10 32.8	15.65	21 13.7
15	4 45 1.98	7.395	22 16 42.2	15.14	21 12.7
16	4 47 59.44	+7.394	+22 22 39.1	+14.62	21 11.7
17	4 50 56.88	7.392	22 28 23.6	14.10	21 10.7
18	4 53 54.28	7.390	22 33 55.7	13.58	21 9.7
19	4 56 51.63	7.388	22 39 15.3	13.06	21 8.7
20	4 59 48.91	7.385	22 44 22.4	12.54	21 7.7
21	5 2 46.13	+7.381	+22 49 17.0	+12.02	21 6.7
22	5 5 43.26	7.377	22 53 59.2	11.50	21 5.7
23	5 8 40.30	7.373	22 58 28.9	10.98	21 4.7
24	5 11 37.22	7.369	23 2 46.1	10.46	21 3.7
25	5 14 34.03	7.364	23 6 50.9	9.94	21 2.7
26	5 17 30.70	+7.358	+23 10 43.3	+ 9.42	21 1.7
27	5 20 27.23	7.352	23 14 23.2	8.90	21 0.7
28	5 23 23.60	7.345	23 17 50.7	8.38	20 59.7
29	5 26 19.81	7.338	23 21 5.9	7.87	20 58.7
30	5 29 15.84	7.330	23 24 8.7	7.36	20 57.7
31	5 32 11.68	+7.322	+23 26 59.2	+ 6.85	20 56.7
32	5 35 7.32	+7.314	+23 29 37.5	+ 6.34	20 55.7

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . . .	2.37	2.39	2.41	2.43	2.45	2.47
Hor. Parallax . . .	4.15	4.18	4.21	4.25	4.29	4.33

AUGUST.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	5 35 7.32	+7.314	+23 29 37.5	+6.34	20 55.7
2	5 38 2.75	7.305	23 32 3.5	5.83	20 54.6
3	5 40 57.96	7.296	23 34 17.3	5.32	20 53.6
4	5 43 52.95	7.286	23 36 18.9	4.81	20 52.6
5	5 46 47.70	7.276	23 38 8.4	4.31	20 51.6
6	5 49 42.21	+7.266	+23 39 45.9	+3.81	20 50.5
7	5 52 36.46	7.255	23 41 11.4	3.31	20 49.5
8	5 55 30.45	7.244	23 42 24.9	2.81	20 48.4
9	5 58 24.17	7.232	23 43 26.5	2.32	20 47.4
10	6 1 17.61	7.220	23 44 16.3	1.83	20 46.3
11	6 4 10.76	+7.208	+23 44 54.3	+1.34	20 45.3
12	6 7 3.61	7.196	23 45 20.5	0.85	20 44.2
13	6 9 56.17	7.183	23 45 35.1	+0.37	20 43.2
14	6 12 48.41	7.170	23 45 38.1	−0.11	20 42.1
15	6 15 40.34	7.156	23 45 29.6	0.59	20 41.0
16	6 18 31.93	+7.142	+23 45 9.7	−1.06	20 39.9
17	6 21 23.18	7.128	23 44 38.4	1.53	20 38.8
18	6 24 14.07	7.113	23 43 55.9	2.00	20 37.7
19	6 27 4.59	7.097	23 43 2.2	2.46	20 36.6
20	6 29 54.73	7.081	23 41 57.4	2.92	20 35.5
21	6 32 44.48	+7.064	+23 40 41.6	−3.38	20 34.4
22	6 35 33.82	7.047	23 39 14.9	3.83	20 33.3
23	6 38 22.75	7.030	23 37 37.4	4.28	20 32.1
24	6 41 11.25	7.012	23 35 49.3	4.72	20 31.0
25	6 43 59.31	6.993	23 33 50.6	5.16	20 29.8
26	6 46 46.93	+6.974	+23 31 41.4	−5.59	20 28.7
27	6 49 34.08	6.955	23 29 21.8	6.02	20 27.5
28	6 52 20.77	6.935	23 26 52.0	6.45	20 26.4
29	6 55 6.98	6.915	23 24 12.0	6.87	20 25.2
30	6 57 52.71	6.895	23 21 22.0	7.29	20 24.0
31	7 0 37.95	+6.874	+23 18 22.1	−7.70	20 22.8
32	7 3 22.68	+6.853	+23 15 12.3	−8.11	20 21.6

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″
Semidiameter . . .	2.49	2.52	2.55	2.58	2.62	2.66
Hor. Parallax . . .	4.37	4.42	4.47	4.53	4.59	4.65

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	7 3 22.68	+6.853	+23 15 12.3	− 8.11	20 21.6	1	8 21 19.68	+6.094	+20 34 59.7	−17.67	19 41.0
2	7 6 6.90	6.832	23 11 52.9	8.51	20 20.4	2	8 23 45.58	6.065	20 27 52.8	17.90	19 39.5
3	7 8 50.61	6.811	23 8 23.9	8.90	20 19.1	3	8 26 10.78	6.036	20 20 40.6	18.12	19 38.0
4	7 11 33.79	6.789	23 4 45.5	9.29	20 17.9	4	8 28 35.27	6.007	20 13 23.3	18.33	19 36.5
5	7 14 16.45	6.767	23 0 57.7	9.68	20 16.6	5	8 30 59.04	5.977	20 6 1.1	18.53	19 34.9
6	7 16 58.58	+6.745	+22 57 0.7	−10.06	20 15.4	6	8 33 22.10	+5.947	+19 58 34.1	−18.72	19 33.3
7	7 19 40.17	6.722	22 52 54.6	10.44	20 14.1	7	8 35 44.45	5.917	19 51 2.4	18.91	19 31.7
8	7 22 21.22	6.699	22 48 39.5	10.81	20 12.9	8	8 38 6.07	5.887	19 43 26.3	19.09	19 30.1
9	7 25 1.72	6.676	22 44 15.5	11.18	20 11.6	9	8 40 26.97	5.857	19 35 45.9	19.26	19 28.5
10	7 27 41.67	6.653	22 39 42.8	11.54	20 10.4	10	8 42 47.14	5.826	19 28 1.3	19.43	19 26.9
11	7 30 21.06	+6.630	+22 35 1.6	−11.90	20 9.1	11	8 45 6.58	+5.795	+19 20 12.8	−19.60	19 25.3
12	7 32 59.89	6.606	22 30 11.9	12.25	20 7.8	12	8 47 25.28	5.764	19 12 20.4	19.76	19 23.7
13	7 35 38.14	6.582	22 25 13.8	12.59	20 6.5	13	8 49 43.24	5.733	19 4 24.5	19.91	19 22.0
14	7 38 15.82	6.558	22 20 7.6	12.92	20 5.2	14	8 52 0.44	5.701	18 56 25.3	20.05	19 20.4
15	7 40 52.91	6.533	22 14 53.3	13.25	20 3.9	15	8 54 16.88	5.669	18 48 22.7	20.18	19 18.8
16	7 43 29.41	+6.508	+22 9 31.2	−13.58	20 2.5	16	8 56 32.55	+5.637	+18 40 17.1	−20.30	19 17.0
17	7 46 5.30	6.483	22 4 1.3	13.90	20 1.2	17	8 58 47.44	5.604	18 32 8.5	20.41	19 15.3
18	7 48 40.58	6.457	21 58 23.9	14.21	19 59.8	18	9 1 1.54	5.571	18 23 57.3	20.51	19 13.6
19	7 51 15.23	6.431	21 52 39.0	14.51	19 58.4	19	9 3 14.85	5.538	18 15 43.7	20.61	19 11.8
20	7 53 49.25	6.404	21 46 46.9	14.81	19 57.0	20	9 5 27.35	5.504	18 7 27.7	20.70	19 10.1
21	7 56 22.63	+6.377	+21 40 47.7	−15.11	19 55.6	21	9 7 39.03	+5.470	+17 59 9.6	−20.79	19 8.4
22	7 58 55.36	6.350	21 34 41.5	15.40	19 54.2	22	9 9 49.90	5.436	17 50 49.6	20.87	19 6.6
23	8 1 27.43	6.323	21 28 28.5	15.68	19 52.8	23	9 11 59.94	5.401	17 42 27.9	20.94	19 4.8
24	8 3 58.84	6.295	21 22 9.0	15.95	19 51.4	24	9 14 9.14	5.366	17 34 4.7	21.00	19 3.0
25	8 6 29.59	6.267	21 15 43.0	16.22	19 50.0	25	9 16 17.50	5.331	17 25 40.2	21.06	19 1.2
26	8 8 59.66	+6.239	+21 9 10.7	−16.48	19 48.5	26	9 18 25.01	+5.295	+17 17 14.5	−21.11	18 59.4
27	8 11 29.05	6.210	21 2 32.3	16.73	19 47.0	27	9 20 31.67	5.259	17 8 47.8	21.15	18 57.5
28	8 13 57.75	6.181	20 55 47.8	16.97	19 45.5	28	9 22 37.46	5.223	17 0 20.2	21.18	18 55.6
29	8 16 25.76	6.152	20 48 57.4	17.21	19 44.0	29	9 24 42.37	5.187	16 51 52.0	21.20	18 53.8
30	8 18 53.07	6.123	20 42 1.3	17.44	19 42.5	30	9 26 46.41	5.150	16 43 23.3	21.21	18 51.9
31	8 21 19.68	+6.094	+20 34 59.7	−17.67	19 41.0	31	9 28 49.56	+5.113	+16 34 54.4	−21.21	18 50.0
32	8 23 45.58	+6.065	+20 27 52.8	−17.90	19 39.5	32	9 30 51.83	+5.076	+16 26 25.3	−21.21	18 48.1

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter . . .	2.70	2.74	2.78	2.83	2.88	2.94	Semidiameter . . .	3.00	3.06	3.13	3.20	3.29	3.38
Hor. Parallax . . .	4.72	4.80	4.88	4.96	5.05	5.14	Hor. Parallax . . .	5.24	5.36	5.48	5.62	5.76	5.91

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	9 30 51.83	+5.076	+16 26 25.3	−21.21	18 48.1
2	9 32 53.20	5.039	16 17 56.3	21.20	18 46.2
3	9 34 53.67	5.001	16 9 27.6	21.18	18 44.2
4	9 36 53.24	4.963	16 0 59.3	21.16	18 42.3
5	9 38 51.89	4.925	15 52 31.6	21.13	18 40.3
6	9 40 49.63	+4.886	+15 44 4.6	−21.10	18 38.3
7	9 42 46.44	4.847	15 35 38.6	21.06	18 36.3
8	9 44 42.32	4.808	15 27 13.8	21.01	18 34.3
9	9 46 37.25	4.768	15 18 50.4	20.95	18 32.2
10	9 48 31.22	4.728	15 10 28.7	20.88	18 30.2
11	9 50 24.21	+4.687	+15 2 8.7	−20.79	18 28.1
12	9 52 16.22	4.646	14 53 50.8	20.69	18 26.0
13	9 54 7.23	4.604	14 45 35.2	20.58	18 23.9
14	9 55 57.22	4.561	14 37 22.1	20.47	18 21.8
15	9 57 46.18	4.518	14 29 11.8	20.36	18 19.7
16	9 59 34.09	+4.474	+14 21 4.4	−20.24	18 17.5
17	10 1 20.93	4.429	14 13 0.2	20.11	18 15.3
18	10 3 6.70	4.383	14 4 59.4	19.97	18 13.1
19	10 4 51.37	4.337	13 57 2.3	19.81	18 10.9
20	10 6 34.92	4.291	13 49 9.0	19.64	18 8.7
21	10 8 17.34	+4.244	+13 41 19.9	−19.46	18 6.5
22	10 9 58.61	4.196	13 33 35.1	19.27	18 4.2
23	10 11 38.71	4.147	13 25 54.9	19.07	18 1.9
24	10 13 17.62	4.097	13 18 19.5	18.86	17 59.6
25	10 14 55.33	4.046	13 10 49.1	18.65	17 57.3
26	10 16 31.81	+3.995	+13 3 24.0	−18.43	17 54.9
27	10 18 7.06	3.943	12 56 4.3	18.20	17 52.6
28	10 19 41.05	3.890	12 48 50.2	17.96	17 50.2
29	10 21 13.77	3.837	12 41 42.1	17.71	17 47.8
30	10 22 45.21	3.783	12 34 40.0	17.45	17 45.4
31	10 24 15.34	+3.728	+12 27 44.3	−17.19	17 42.9
32	10 25 44.14	+3.672	+12 20 55.1	−16.92	17 40.4

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter . . .	3.47	3.57	3.68	3.80	3.93	4.07
Hor. Parallax . . .	6.07	6.25	6.44	6.65	6.88	7.13

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	10 24 15.34	+3.728	+12 27 44.3	−17.19	17 42.9
2	10 25 44.14	3.672	12 20 55.1	16.92	17 40.4
3	10 27 11.60	3.615	12 14 12.6	16.64	17 37.9
4	10 28 37.70	3.558	12 7 37.2	16.34	17 35.4
5	10 30 2.41	3.500	12 1 9.1	16.03	17 32.9
6	10 31 25.72	+3.441	+11 54 48.5	−15.70	17 30.3
7	10 32 47.59	3.381	11 48 35.7	15.36	17 27.7
8	10 34 8.00	3.319	11 42 30.9	15.01	17 25.1
9	10 35 26.93	3.256	11 36 34.5	14.66	17 22.4
10	10 36 44.33	3.192	11 30 46.7	14.30	17 19.8
11	10 38 0.18	+3.127	+11 25 7.8	−13.93	17 17.1
12	10 39 14.44	3.060	11 19 38.2	13.55	17 14.4
13	10 40 27.09	2.992	11 14 18.0	13.15	17 11.6
14	10 41 38.09	2.922	11 9 7.7	12.73	17 8.8
15	10 42 47.40	2.851	11 4 7.5	12.30	17 6.0
16	10 43 54.98	+2.779	+10 59 17.7	−11.85	17 3.2
17	10 45 0.81	2.705	10 54 38.5	11.39	17 0.4
18	10 46 4.84	2.630	10 50 10.3	10.92	16 57.5
19	10 47 7.04	2.553	10 45 53.4	10.45	16 54.5
20	10 48 7.36	2.474	10 41 48.0	9.97	16 51.6
21	10 49 5.77	+2.393	+10 37 54.4	− 9.48	16 48.6
22	10 50 2.24	2.311	10 34 12.9	8.98	16 45.6
23	10 50 56.74	2.227	10 30 43.8	8.46	16 42.5
24	10 51 49.22	2.142	10 27 27.4	7.93	16 39.4
25	10 52 39.64	2.056	10 24 23.7	7.38	16 36.3
26	10 53 27.96	+1.969	+10 21 33.2	− 6.82	16 33.2
27	10 54 14.16	1.880	10 18 56.1	6.25	16 30.0
28	10 54 58.20	1.790	10 16 32.6	5.67	16 26.8
29	10 55 40.04	1.698	10 14 22.9	5.09	16 23.5
30	10 56 19.65	1.604	10 12 27.4	4.50	16 20.2
31	10 56 56.99	+1.508	+10 10 46.2	− 3.91	16 16.9
32	10 57 32.03	+1.411	+10 9 19.7	− 3.30	16 13.5

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″	″
Semidiameter .	4.22	4.38	4.55	4.75	4.95	5.16	5.40
Hor. Parallax .	7.39	7.68	7.99	8.32	8.67	9.05	9.45

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	15 57 7.08	+2.027	−19 37 13.5	−5.91	21 11.6	1	16 19 33.91	+1.543	−20 36 3.4	−3.58	19 31.9
2	15 57 55.61	2.017	19 39 34.3	5.83	21 8.5	2	16 20 10.69	1.522	20 37 28.3	3.50	19 28.6
3	15 58 43.87	2.005	19 41 53.5	5.76	21 5.4	3	16 20 46.96	1.501	20 38 51.5	3.43	19 25.3
4	15 59 31.85	1.993	19 44 10.9	5.69	21 2.3	4	16 21 22.72	1.480	20 40 12.9	3.35	19 21.9
5	16 0 19.54	1.981	19 46 26.5	5.62	20 59.1	5	16 21 57.96	1.458	20 41 32.5	3.28	19 18.6
6	16 1 6.94	+1.969	−19 48 40.2	−5.54	20 56.0	6	16 22 32.66	+1.436	−20 42 50.3	−3.21	19 15.2
7	16 1 54.05	1.956	19 50 52.2	5.47	20 52.8	7	16 23 6.83	1.413	20 44 6.2	3.13	19 11.8
8	16 2 40.85	1.943	19 53 2.4	5.39	20 49.6	8	16 23 40.47	1.390	20 45 20.5	3.06	19 8.4
9	16 3 27.33	1.930	19 55 10.7	5.31	20 46.4	9	16 24 13.55	1.367	20 46 33.0	2.99	19 5.0
10	16 4 13.49	1.917	19 57 17.2	5.24	20 43.3	10	16 24 46.07	1.344	20 47 43.7	2.91	19 1.6
11	16 4 59.33	+1.903	−19 59 22.0	−5.16	20 40.1	11	16 25 18.03	+1.320	−20 48 52.6	−2.84	18 58.2
12	16 5 44.84	1.889	20 1 25.0	5.09	20 36.9	12	16 25 49.42	1.296	20 49 59.8	2.77	18 54.8
13	16 6 30.01	1.875	20 3 26.1	5.02	20 33.7	13	16 26 20.24	1.272	20 51 5.3	2.69	18 51.4
14	16 7 14.82	1.860	20 5 25.4	4.94	20 30.5	14	16 26 50.47	1.247	20 52 9.0	2.62	18 47.9
15	16 7 59.29	1.845	20 7 22.9	4.86	20 27.3	15	16 27 20.10	1.222	20 53 11.1	2.55	18 44.5
16	16 8 43.40	+1.830	−20 9 18.6	−4.79	20 24.1	16	16 27 49.14	+1.197	−20 54 11.4	−2.48	18 41.0
17	16 9 27.14	1.815	20 11 12.5	4.71	20 20.9	17	16 28 17.57	1.172	20 55 10.0	2.41	18 37.6
18	16 10 10.51	1.799	20 13 4.6	4.63	20 17.7	18	16 28 45.39	1.146	20 56 6.9	2.33	18 34.1
19	16 10 53.50	1.783	20 14 54.9	4.56	20 14.5	19	16 29 12.59	1.120	20 57 2.1	2.26	18 30.6
20	16 11 36.10	1.767	20 16 43.4	4.48	20 11.3	20	16 29 39.16	1.094	20 57 55.6	2.19	18 27.1
21	16 12 18.30	+1.750	−20 18 30.0	−4.40	20 8.0	21	16 30 5.09	+1.067	−20 58 47.4	−2.12	18 23.6
22	16 13 0.10	1.733	20 20 14.8	4.33	20 4.8	22	16 30 30.37	1.040	20 59 37.5	2.05	18 20.1
23	16 13 41.49	1.716	20 21 57.8	4.25	20 1.5	23	16 30 55.01	1.013	21 0 25.9	1.98	18 16.6
24	16 14 22.45	1.698	20 23 39.0	4.18	19 58.3	24	16 31 18.99	0.985	21 1 12.6	1.91	18 13.0
25	16 15 2.98	1.680	20 25 18.4	4.11	19 55.0	25	16 31 42.30	0.957	21 1 57.6	1.84	18 9.5
26	16 15 43.06	+1.661	−20 26 56.0	−4.03	19 51.7	26	16 32 4.92	+0.928	−21 2 41.0	−1.77	18 5.9
27	16 16 22.70	1.642	20 28 31.8	3.95	19 48.4	27	16 32 26.85	0.900	21 3 22.7	1.70	18 2.3
28	16 17 1.89	1.623	20 30 5.8	3.88	19 45.1	28	16 32 48.09	0.871	21 4 2.7	1.63	17 58.7
29	16 17 40.61	1.604	20 31 37.9	3.81	19 41.8	29	16 33 8.64	0.842	21 4 41.1	1.57	17 55.1
30	16 18 18.86	1.584	20 33 8.2	3.73	19 38.5	30	16 33 28.49	0.812	21 5 17.9	1.50	17 51.5
31	16 18 56.63	+1.564	−20 34 36.7	−3.66	19 35.2	31	16 33 47.62	+0.782	−21 5 53.0	−1.43	17 47.8
32	16 19 33.91	+1.543	−20 36 3.4	−3.58	19 31.9	32	16 34 6.03	+0.752	−21 6 26.5	−1.36	17 44.2

Day of the Month.	2d.	10th.	18th.	26th.	Day of the Month.	3d.	11th.	19th.	27th.
	″	″	″	″		″	″	″	″
Semidiameter	15.4	15.7	16.0	16.3	Semidiameter	16.6	16.9	17.3	17.8
Horizontal Parallax . .	1.5	1.6	1.6	1.6	Horizontal Parallax . .	1.6	1.6	1.6	1.7

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	16 33 8.64	+0.842	−21 4 41.1	−1.57	17 55.1	1	16 37 33.13	−0.152	−21 11 22.8	+0.46	15 57.3
2	16 33 28.49	0.812	21 5 17.9	1.50	17 51.5	2	16 37 29.07	0.186	21 11 11.1	0.52	15 53.3
3	16 33 47.62	0.782	21 5 53.0	1.43	17 47.8	3	16 37 24.21	0.219	21 10 57.9	0.58	15 49.3
4	16 34 6.03	0.752	21 6 26.5	1.36	17 44.2	4	16 37 18.56	0.252	21 10 43.2	0.65	15 45.3
5	16 34 23.72	0.722	21 6 58.4	1.29	17 40.6	5	16 37 12.12	0.285	21 10 27.0	0.71	15 41.2
6	16 34 40.68	+0.692	−21 7 28.6	−1.22	17 36.9	6	16 37 4.90	−0.317	−21 10 9.3	+0.77	15 37.2
7	16 34 56.91	0.661	21 7 57.2	1.16	17 33.3	7	16 36 56.89	0.350	21 9 50.1	0.83	15 33.1
8	16 35 12.41	0.690	21 8 24.2	1.09	17 29.6	8	16 36 48.10	0.382	21 9 29.5	0.89	15 29.0
9	16 35 27.16	0.599	21 8 49.6	1.03	17 25.9	9	16 36 38.54	0.414	21 9 7.4	0.95	15 24.9
10	16 35 41.16	0.568	21 9 13.4	0.97	17 22.2	10	16 36 28.22	0.446	21 8 43.9	1.01	15 20.8
11	16 35 54.42	+0.537	−21 9 35.6	−0.90	17 18.5	11	16 36 17.14	−0.478	−21 8 18.9	+1.07	15 16.7
12	16 36 6.92	0.505	21 9 56.3	0.83	17 14.7	12	16 36 5.31	0.509	21 7 52.4	1.13	15 12.5
13	16 36 18.66	0.473	21 10 15.4	0.76	17 11.0	13	16 35 52.73	0.540	21 7 24.5	1.19	15 8.4
14	16 36 29.64	0.442	21 10 32.9	0.69	17 7.2	14	16 35 39.41	0.571	21 6 55.2	1.25	15 4.2
15	16 36 39.86	0.410	21 10 48.8	0.63	17 3.4	15	16 35 25.36	0.601	21 6 24.4	1.31	15 0.0
16	16 36 49.31	+0.378	−21 11 3.2	−0.57	16 59.6	16	16 35 10.58	−0.631	−21 5 52.2	+1.37	14 55.9
17	16 36 57.98	0.346	21 11 16.0	0.50	16 55.8	17	16 34 55.07	0.661	21 5 18.6	1.43	14 51.7
18	16 37 5.87	0.313	21 11 27.2	0.43	16 52.0	18	16 34 38.85	0.690	21 4 43.6	1.49	14 47.5
19	16 37 12.99	0.280	21 11 36.8	0.37	16 48.2	19	16 34 21.94	0.719	21 4 7.2	1.55	14 43.2
20	16 37 19.33	0.247	21 11 44.9	0.30	16 44.4	20	16 34 4.34	0.748	21 3 29.3	1.61	14 39.0
21	16 37 24.87	+0.214	−21 11 51.5	−0.24	16 40.6	21	16 33 46.03	−0.777	−21 2 50.2	+1.66	14 34.8
22	16 37 29.62	0.181	21 11 56.5	0.18	16 36.7	22	16 33 27.05	0.805	21 2 9.7	1.72	14 30.5
23	16 37 33.58	0.148	21 12 0.0	0.11	16 32.8	23	16 33 7.42	0.832	21 1 27.8	1.78	14 26.2
24	16 37 36.74	0.115	21 12 2.0	−0.05	16 28.9	24	16 32 47.14	0.859	21 0 44.5	1.83	14 22.0
25	16 37 39.10	0.082	21 12 2.4	+0.01	16 25.0	25	16 32 26.21	0.886	20 59 59.9	1.89	14 17.7
26	16 37 40.66	+0.049	−21 12 1.3	+0.08	16 21.1	26	16 32 4.65	−0.912	−20 59 14.0	+1.95	14 13.4
27	16 37 41.42	+0.016	21 11 58.7	0.14	16 17.2	27	16 31 42.46	0.937	20 58 26.8	2.00	14 9.1
28	16 37 41.37	−0.017	21 11 54.6	0.20	16 13.2	28	16 31 19.66	0.962	20 57 38.2	2.05	14 4.8
29	16 37 40.52	0.051	21 11 48.9	0.27	16 9.3	29	16 30 56.28	0.986	20 56 48.4	2.10	14 0.5
30	16 37 38.86	0.084	21 11 41.7	0.33	16 5.3	30	16 30 32.33	1.009	20 55 57.4	2.15	13 56.1
31	16 37 36.40	−0.118	−21 11 33.0	+0.39	16 1.3	31	16 30 7.83	−1.032	−20 55 5.2	+2.20	13 51.8
32	16 37 33.13	−0.152	−21 11 22.8	+0.46	15 57.3	32	16 29 42.80	−1.054	−20 54 11.7	+2.25	13 47.5

Day of the Month.	7th.	15th.	23d.	31st.	Day of the Month.	8th.	16th.	24th.
	″	″	″	″		″	″	″
Semidiameter	18.2	18.7	19.1	19.5	Semidiameter	20.1	20.5	20.9
Horizontal Parallax . .	1.7	1.8	1.8	1.8	Horizontal Parallax	1.9	1.9	2.0

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign − indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

	MAY.						JUNE.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	16 30 7.83	−1.032	−20 55 5.2	+2.20	13 51.8	1	16 14 36.35	−1.333	−20 20 50.7	+3.04	11 34.4
2	16 29 42.80	1.054	20 54 11.7	2.25	13 47.5	2	16 14 4.41	1.328	20 19 37.7	3.04	11 29.9
3	16 29 17.24	1.075	20 53 17.1	2.30	13 43.1	3	16 13 32.62	1.322	20 18 24.8	3.03	11 25.5
4	16 28 51.18	1.096	20 52 21.4	2.35	13 38.7	4	16 13 0.97	1.315	20 17 12.1	3.02	11 21.0
5	16 28 24.64	1.116	20 51 24.6	2.40	13 34.3	5	16 12 29.50	1.307	20 15 59.7	3.01	11 16.6
6	16 27 57.63	−1.135	−20 50 26.6	+2.44	13 30.0	6	16 11 58.22	−1.298	−20 14 47.7	+3.00	11 12.1
7	16 27 30.17	1.153	20 49 27.6	2.49	13 25.6	7	16 11 27.15	1.289	20 13 36.0	2.98	11 7.7
8	16 27 2.28	1.170	20 48 27.6	2.53	13 21.2	8	16 10 56.32	1.279	20 12 24.7	2.96	11 3.2
9	16 26 33.99	1.187	20 47 26.5	2.57	13 16.7	9	16 10 25.75	1.268	20 11 14.0	2.94	10 58.8
10	16 26 5.31	1.203	20 46 24.4	2.61	13 12.3	10	16 9 55.46	1.256	20 10 3.9	2.91	10 54.4
11	16 25 36.26	−1.218	−20 45 21.4	+2.65	13 7.9	11	16 9 25.48	−1.243	−20 8 54.4	+2.88	10 49.9
12	16 25 6.85	1.232	20 44 17.5	2.68	13 3.5	12	16 8 55.80	1.229	20 7 45.5	2.85	10 45.5
13	16 24 37.11	1.245	20 43 12.7	2.72	12 59.1	13	16 8 26.46	1.215	20 6 37.4	2.82	10 41.1
14	16 24 7.06	1.258	20 42 7.0	2.75	12 54.6	14	16 7 57.47	1.200	20 5 30.1	2.79	10 36.7
15	16 23 36.71	1.270	20 41 0.5	2.78	12 50.2	15	16 7 28.85	1.184	20 4 23.6	2.75	10 32.3
16	16 23 6.09	−1.281	−20 39 53.3	+2.81	12 45.8	16	16 7 0.61	−1.168	−20 3 18.0	+2.71	10 27.9
17	16 22 35.22	1.291	20 38 45.4	2.84	12 41.3	17	16 6 32.78	1.151	20 2 13.4	2.67	10 23.5
18	16 22 4.12	1.300	20 37 36.8	2.87	12 36.9	18	16 6 5.37	1.133	20 1 9.9	2.63	10 19.1
19	16 21 32.80	1.308	20 36 27.5	2.90	12 32.4	19	16 5 38.40	1.114	20 0 7.4	2.58	10 14.7
20	16 21 1.29	1.316	20 35 17.6	2.93	12 28.0	20	16 5 11.88	1.095	19 59 6.1	2.53	10 10.4
21	16 20 29.61	−1.323	−20 34 7.2	+2.95	12 23.5	21	16 4 45.84	−1.075	−19 58 6.0	+2.48	10 6.0
22	16 19 57.78	1.329	20 32 56.2	2.97	12 19.0	22	16 4 20.29	1.054	19 57 7.1	2.43	10 1.7
23	16 19 25.82	1.334	20 31 44.7	2.99	12 14.6	23	16 3 55.25	1.032	19 56 9.4	2.38	9 57.3
24	16 18 53.76	1.337	20 30 32.9	3.00	12 10.1	24	16 3 30.73	1.010	19 55 13.1	2.32	9 53.0
25	16 18 21.62	1.340	20 29 20.8	3.01	12 5.6	25	16 3 6.75	0.987	19 54 18.3	2.26	9 48.7
26	16 17 49.42	−1.342	−20 28 8.4	+3.02	12 1.2	26	16 2 43.32	−0.963	−19 53 25.0	+2.19	9 44.4
27	16 17 17.19	1.343	20 26 55.7	3.03	11 56.7	27	16 2 20.46	0.939	19 52 33.1	2.13	9 40.1
28	16 16 44.95	1.343	20 25 42.9	3.04	11 52.2	28	16 1 58.18	0.915	19 51 42.8	2.06	9 35.8
29	16 16 12.72	1.342	20 24 29.9	3.04	11 47.8	29	16 1 36.50	0.890	19 50 54.2	1.99	9 31.5
30	16 15 40.53	1.340	20 23 16.8	3.05	11 43.3	30	16 1 15.43	0.864	19 50 7.2	1.92	9 27.2
31	16 15 8.40	−1.337	−20 22 3.7	+3.05	11 38.8	31	16 0 54.99	−0.838	−19 49 21.8	+1.85	9 22.9
32	16 14 36.35	−1.333	−20 20 50.7	+3.04	11 34.4	32	16 0 35.18	−0.812	−19 48 38.2	+1.78	9 18.7

Day of the Month.	2d.	10th.	18th.	26th.	Day of the Month.	3d.	11th.	19th.	27th.
	″	″	″	″		″	″	″	″
Semidiameter	21.2	21.5	21.7	21.8	Semidiameter	21.7	21.6	21.4	21.1
Horizontal Parallax . .	2.0	2.0	2.0	2.0	Horizontal Parallax . .	2.0	2.0	2.0	2.0

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

	JULY.						AUGUST.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	16 0 54.99	−0.838	−19 49 21.8	+1.85	9 22.9	1	15 56 9.78	+0.101	−19 42 38.5	−0.88	7 16.4
2	16 0 35.18	0.812	19 48 38.2	1.78	9 18.7	2	15 56 12.58	0.133	19 43 0.6	0.97	7 12.5
3	16 0 16.01	0.785	19 47 56.4	1.71	9 14.4	3	15 56 16.14	0.165	19 43 24.9	1.06	7 8.7
4	15 59 57.49	0.758	19 47 16.4	1.63	9 10.2	4	15 56 20.46	0.196	19 43 51.4	1.15	7 4.8
5	15 59 39.63	0.730	19 46 38.3	1.55	9 6.0	5	15 56 25.54	0.228	19 44 20.1	1.24	7 1.0
6	15 59 22.45	−0.702	−19 46 2.1	+1.47	9 1.7	6	15 56 31.39	+0.259	−19 44 51.1	−1.33	6 57.1
7	15 59 5.95	0.674	19 45 27.8	1.39	8 57.5	7	15 56 37.99	0.290	19 45 24.2	1.42	6 53.3
8	15 58 50.13	0.645	19 44 55.4	1.31	8 53.4	8	15 56 45.33	0.321	19 45 59.4	1.51	6 49.5
9	15 58 35.00	0.616	19 44 25.0	1.23	8 49.2	9	15 56 53.42	0.352	19 46 36.7	1.61	6 45.7
10	15 58 20.58	0.587	19 43 56.5	1.14	8 45.0	10	15 57 2.25	0.383	19 47 16.1	1.69	6 41.9
11	15 58 6.86	−0.557	−19 43 30.2	+1.05	8 40.9	11	15 57 11.82	+0.414	−19 47 57.7	−1.78	6 38.2
12	15 57 53.85	0.527	19 43 6.0	0.97	8 36.7	12	15 57 22.12	0.445	19 48 41.3	1.86	6 34.5
13	15 57 41.57	0.497	19 42 43.9	0.88	8 32.6	13	15 57 33.15	0.475	19 49 26.9	1.94	6 30.7
14	15 57 30.01	0.467	19 42 23.8	0.79	8 28.5	14	15 57 44.91	0.505	19 50 14.5	2.03	6 26.9
15	15 57 19.16	0.437	19 42 5.8	0.70	8 24.4	15	15 57 57.40	0.535	19 51 4.1	2.11	6 23.2
16	15 57 9.05	−0.406	−19 41 50.0	+0.61	8 20.3	16	15 58 10.61	+0.565	−19 51 55.7	−2.19	6 19.5
17	15 56 59.68	0.375	19 41 36.3	0.52	8 16.2	17	15 58 24.53	0.595	19 52 49.3	2.28	6 15.8
18	15 56 51.05	0.344	19 41 24.8	0.43	8 12.1	18	15 58 39.17	0.625	19 53 45.0	2.36	6 12.1
19	15 56 43.16	0.313	19 41 15.5	0.34	8 8.0	19	15 58 54.54	0.655	19 54 42.5	2.44	6 8.4
20	15 56 36.02	0.282	19 41 8.4	0.25	8 4.0	20	15 59 10.61	0.684	19 55 41.9	2.52	6 4.8
21	15 56 29.63	−0.251	−19 41 3.6	+0.16	8 0.0	21	15 59 27.38	+0.713	−19 56 43.1	−2.60	6 1.1
22	15 56 24.00	0.219	19 41 1.0	+0.07	7 55.9	22	15 59 44.84	0.742	19 57 46.2	2.67	5 57.5
23	15 56 19.13	0.187	19 41 0.6	−0.03	7 51.9	23	16 0 3.02	0.771	19 58 51.1	2.74	5 53.9
24	15 56 15.02	0.155	19 41 2.5	0.12	7 47.9	24	16 0 21.88	0.800	19 59 57.8	2.81	5 50.3
25	15 56 11.67	0.123	19 41 6.6	0.21	7 43.9	25	16 0 41.43	0.829	20 1 6.2	2.88	5 46.7
26	15 56 9.10	−0.091	−19 41 13.0	−0.31	7 40.0	26	16 1 1.67	+0.858	−20 2 16.3	−2.95	5 43.1
27	15 56 7.29	0.059	19 41 21.6	0.40	7 36.0	27	16 1 22.59	0.886	20 3 28.1	3.02	5 39.5
28	15 56 6.25	−0.027	19 41 32.5	0.50	7 32.1	28	16 1 44.18	0.914	20 4 41.5	3.09	5 35.9
29	15 56 5.98	+0.005	19 41 45.6	0.59	7 28.1	29	16 2 6.45	0.942	20 5 56.5	3.16	5 32.3
30	15 56 6.48	0.037	19 42 1.0	0.69	7 24.2	30	16 2 29.35	0.969	20 7 13.2	3.23	5 28.8
31	15 56 7.75	+0.069	−19 42 18.6	−0.78	7 20.3	31	16 2 52.93	+0.996	−20 8 31.5	−3.29	5 25.2
32	15 56 9.78	+0.101	−19 42 38.5	−0.88	7 16.4	32	16 3 17.15	+1.023	−20 9 51.2	−3.35	5 21.7

Day of the Month.	5th.	13th.	21st.	29th.	Day of the Month.	6th.	14th.	22d.	30th.
	″	″	″	″		″	″	″	″
Semidiameter	20.8	20.4	20.0	19.5	Semidiameter	19.1	18.7	18.2	17.8
Horizontal Parallax . .	2.0	1.9	1.9	1.8	Horizontal Parallax . .	1.8	1.8	1.7	1.7

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	16 3 17.15	+1.023	−20 9 51.2	−3.35	5 21.7
2	16 3 42.01	1.050	20 11 12.3	3.41	5 18.2
3	16 4 7.52	1.076	20 12 34.8	3.47	5 14.7
4	16 4 33.65	1.102	20 13 58.8	3.53	5 11.2
5	16 5 0.40	1.128	20 15 24.2	3.59	5 7.7
6	16 5 27.77	+1.154	−20 16 50.9	−3.64	5 4.2
7	16 5 55.76	1.179	20 18 19.0	3.69	5 0.8
8	16 6 24.35	1.204	20 19 48.3	3.74	4 57.3
9	16 6 53.53	1.228	20 21 18.8	3.79	4 53.9
10	16 7 23.30	1.253	20 22 50.4	3.84	4 50.4
11	16 7 53.67	+1.277	−20 24 23.2	−3.89	4 47.0
12	16 8 24.62	1.301	20 25 57.2	3.94	4 43.6
13	16 8 56.14	1.325	20 27 32.2	3.99	4 40.2
14	16 9 28.23	1.349	20 29 8.2	4.04	4 36.8
15	16 10 0.89	1.372	20 30 45.2	4.08	4 33.4
16	16 10 34.11	+1.396	−20 32 23.3	−4.12	4 30.0
17	16 11 7.89	1.419	20 34 2.2	4.15	4 26.6
18	16 11 42.22	1.442	20 35 42.0	4.18	4 23.2
19	16 12 17.10	1.465	20 37 22.7	4.22	4 19.9
20	16 12 52.52	1.487	20 39 4.3	4.25	4 16.5
21	16 13 28.47	+1.509	−20 40 46.6	−4.28	4 13.2
22	16 14 4.95	1.531	20 42 29.6	4.31	4 9.9
23	16 14 41.96	1.553	20 44 13.3	4.34	4 6.6
24	16 15 19.49	1.574	20 45 57.7	4.37	4 3.3
25	16 15 57.52	1.595	20 47 42.7	4.40	4 0.0
26	16 16 36.05	+1.616	−20 49 28.3	−4.42	3 56.7
27	16 17 15.09	1.637	20 51 14.5	4.44	3 53.4
28	16 17 54.61	1.657	20 53 1.2	4.46	3 50.1
29	16 18 34.61	1.677	20 54 48.3	4.48	3 46.9
30	16 19 15.09	1.697	20 56 35.9	4.49	3 43.6
31	16 19 56.06	+1.716	−20 58 23.9	−4.51	3 40.4
32	16 20 37.48	+1.735	−21 0 12.3	−4.53	3 37.1

Day of the Month.	7th.	15th.	23d.
	″	″	″
Semidiameter	17.4	17.0	16.7
Horizontal Parallax	1.6	1.6	1.6

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	16 19 56.06	+1.716	−20 58 23.9	−4.51	3 40.4
2	16 20 37.48	1.735	21 0 12.3	4.53	3 37.1
3	16 21 19.35	1.754	21 2 1.0	4.54	3 33.9
4	16 22 1.67	1.773	21 3 49.9	4.55	3 30.7
5	16 22 44.44	1.791	21 5 39.1	4.56	3 27.5
6	16 23 27.65	+1.809	−21 7 28.6	−4.57	3 24.2
7	16 24 11.28	1.827	21 9 18.2	4.57	3 21.0
8	16 24 55.33	1.845	21 11 7.9	4.57	3 17.8
9	16 25 39.80	1.862	21 12 57.8	4.58	3 14.6
10	16 26 24.69	1.879	21 14 47.7	4.58	3 11.4
11	16 27 9.98	+1.896	−21 16 37.7	−4.58	3 8.2
12	16 27 55.68	1.913	21 18 27.6	4.58	3 5.0
13	16 28 41.78	1.929	21 20 17.5	4.57	3 1.9
14	16 29 28.28	1.945	21 22 7.4	4.57	2 58.7
15	16 30 15.16	1.961	21 23 57.1	4.57	2 55.6
16	16 31 2.42	+1.977	−21 25 46.7	−4.56	2 52.4
17	16 31 50.06	1.993	21 27 36.2	4.56	2 49.3
18	16 32 38.08	2.008	21 29 25.5	4.55	2 46.1
19	16 33 26.46	2.023	21 31 14.5	4.54	2 43.0
20	16 34 15.20	2.038	21 33 3.3	4.53	2 39.9
21	16 35 4.29	+2.053	−21 34 51.8	−4.51	2 36.8
22	16 35 53.74	2.067	21 36 39.9	4.50	2 33.7
23	16 36 43.52	2.081	21 38 27.6	4.49	2 30.6
24	16 37 33.63	2.095	21 40 15.0	4.47	2 27.5
25	16 38 24.08	2.109	21 42 2.0	4.45	2 24.4
26	16 39 14.85	+2.122	−21 43 48.5	−4.43	2 21.3
27	16 40 5.93	2.135	21 45 34.5	4.41	2 18.2
28	16 40 57.32	2.148	21 47 20.0	4.39	2 15.1
29	16 41 49.02	2.160	21 49 5.0	4.36	2 12.1
30	16 42 41.02	2.172	21 50 49.3	4.33	2 9.0
31	16 43 33.30	+2.184	−21 52 33.0	−4.31	2 6.0
32	16 44 25.86	+2.196	−21 54 16.2	−4.29	2 2.9

Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″	″
Semidiameter	16.4	16.1	15.8	15.6
Horizontal Parallax . .	1.5	1.5	1.5	1.5

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	16 44 25.86	+2.196	−21 54 16.2	−4.29	2 2.9
2	16 45 18.69	2.207	21 55 58.7	4.26	1 59.9
3	16 46 11.80	2.218	21 57 40.5	4.23	1 56.8
4	16 47 5.17	2.229	21 59 21.5	4.20	1 53.8
5	16 47 58.80	2.240	22 1 1.8	4.16	1 50.7
6	16 48 52.68	+2.250	−22 2 41.3	−4.13	1 47.7
7	16 49 46.81	2.260	22 4 20.0	4.10	1 44.6
8	16 50 41.18	2.270	22 5 57.9	4.06	1 41.6
9	16 51 35.79	2.280	22 7 35.0	4.03	1 38.6
10	16 52 30.63	2.289	22 9 11.2	3.99	1 35.6
11	16 53 25.70	+2.299	−22 10 46.5	−3.95	1 32.5
12	16 54 20.99	2.308	22 12 20.9	3.91	1 29.5
13	16 55 16.50	2.317	22 13 54.3	3.87	1 26.5
14	16 56 12.22	2.326	22 15 26.8	3.83	1 23.5
15	16 57 8.15	2.335	22 16 58.2	3.79	1 20.5
16	16 58 4.28	+2.343	−22 18 28.6	−3.75	1 17.5
17	16 59 0.60	2.351	22 19 58.1	3.71	1 14.5
18	16 59 57.11	2.359	22 21 26.6	3.67	1 11.5
19	17 0 53.81	2.366	22 22 54.0	3.62	1 8.5
20	17 1 50.67	2.373	22 24 20.2	3.57	1 5.5
21	17 2 47.70	+2.380	−22 25 45.3	−3.53	1 2.5
22	17 3 44.90	2.387	22 27 9.3	3.48	0 59.6
23	17 4 42.26	2.393	22 28 32.2	3.43	0 56.6
24	17 5 39.76	2.399	22 29 53.9	3.38	0 53.6
25	17 6 37.40	2.405	22 31 14.4	3.33	0 50.6
26	17 7 35.19	+2.410	−22 32 33.6	−3.28	0 47.7
27	17 8 33.10	2.415	22 33 51.7	3.23	0 44.7
28	17 9 31.13	2.420	22 35 8.6	3.18	0 41.7
29	17 10 29.28	2.425	22 36 24.2	3.12	0 38.7
30	17 11 27.54	2.429	22 37 38.5	3.07	0 35.8
31	17 12 25.90	+2.433	−22 38 51.6	−3.02	0 32.8
32	17 13 24.35	+2.437	−22 40 3.4	−2.96	0 29.8

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 12 25.90	+2.433	−22 38 51.6	−3.02	0 32.8
2	17 13 24.35	2.437	22 40 3.4	2.96	0 29.8
3	17 14 22.90	2.441	22 41 13.8	2.91	0 26.8
4	17 15 21.54	2.445	22 42 22.9	2.86	0 23.9
5	17 16 20.26	2.448	22 43 30.7	2.80	0 20.9
6	17 17 19.05	+2.451	−22 44 37.2	−2.75	0 18.0
7	17 18 17.91	2.454	22 45 42.3	2.69	0 15.0
8	17 19 16.83	2.456	22 46 46.1	2.63	0 12.1
9	17 20 15.82	2.459	22 47 48.4	2.57	0 9.1
10	17 21 14.86	2.461	22 48 49.4	2.51	0 6.2
11	17 22 13.94	+2.463	−22 49 49.0	−2.45	0 3.2
12	17 23 13.07	2.465	22 50 47.2	2.40	0 0.3 23 57.4
13	17 24 12.25	2.466	22 51 44.0	2.34	23 54.4
14	17 25 11.45	2.467	22 52 39.4	2.28	23 51.5
15	17 26 10.67	2.468	22 53 33.4	2.22	23 48.5
16	17 27 9.90	+2.468	−22 54 25.9	−2.16	23 45.6
17	17 28 9.16	2.469	22 55 17.0	2.10	23 42.6
18	17 29 8.42	2.469	22 56 6.7	2.04	23 39.7
19	17 30 7.68	2.469	22 56 54.9	1.98	23 36.7
20	17 31 6.93	2.469	22 57 41.7	1.92	23 33.8
21	17 32 6.17	+2.468	−22 58 27.0	−1.86	23 30.8
22	17 33 5.38	2.467	22 59 10.9	1.80	23 27.9
23	17 34 4.56	2.465	22 59 53.3	1.74	23 24.9
24	17 35 3.71	2.463	23 0 34.3	1.68	23 22.0
25	17 36 2.82	2.461	23 1 13.9	1.62	23 19.0
26	17 37 1.87	+2.459	−23 1 52.0	−1.56	23 16.1
27	17 38 0.86	2.457	23 2 28.6	1.50	23 13.1
28	17 38 59.80	2.454	23 3 3.8	1.44	23 10.2
29	17 39 58.66	2.451	23 3 37.6	1.38	23 7.2
30	17 40 57.44	2.448	23 4 9.9	1.32	23 4.3
31	17 41 56.14	+2.445	−23 4 40.8	−1.26	23 1.3
32	17 42 54.77	+2.441	−23 5 10.2	−1.20	22 58.4

Day of the Month.	2d.	10th.	18th.	26th.
	″	″	″	″
Semidiameter	15.4	15.3	15.2	15.1
Horizontal Parallax . .	1.5	1.4	1.4	1.4

Day of the Month.	4th.	12th.	20th.	28th.	36th.
	″	″	″	″	″
Semidiameter	15.1	15.0	15.1	15.1	15.2
Horizontal Parallax .	1.4	1.4	1.4	1.4	1.4

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	17 50 22.40	+1.257	−22 25 32.9	−0.40	23 4.4	1	18 4 58.27	+1.067	−22 27 6.1	+0.11	21 16.9
2	17 50 52.52	1.253	22 25 42.3	0.38	23 1.0	2	18 5 23.72	1.057	22 27 3.2	0.13	21 13.4
3	17 51 22.56	1.250	22 25 51.2	0.36	22 57.5	3	18 5 48.95	1.047	22 27 0.0	0.14	21 9.9
4	17 51 52.52	1.246	22 25 59.7	0.34	22 54.1	4	18 6 13.93	1.037	22 26 56.5	0.15	21 6.4
5	17 52 22.39	1.243	22 26 7.7	0.32	22 50.6	5	18 6 38.67	1.027	22 26 52.8	0.16	21 2.9
6	17 52 52.18	+1.239	−22 26 15.2	−0.30	22 47.2	6	18 7 3.17	+1.016	−22 26 48.8	+0.17	20 59.3
7	17 53 21.87	1.235	22 26 22.3	0.29	22 43.7	7	18 7 27.44	1.006	22 26 44.5	0.18	20 55.8
8	17 53 51.45	1.230	22 26 29.0	0.27	22 40.3	8	18 7 51.44	0.995	22 26 40.1	0.19	20 52.2
9	17 54 20.92	1.226	22 26 35.2	0.25	22 36.8	9	18 8 15.18	0.984	22 26 35.4	0.20	20 48.7
10	17 54 50.29	1.221	22 26 40.9	0.23	22 33.4	10	18 8 38.66	0.973	22 26 30.4	0.21	20 45.1
11	17 55 19.54	+1.216	−22 26 46.2	−0.21	22 29.9	11	18 9 1.89	+0.962	−22 26 25.2	+0.22	20 41.6
12	17 55 48.66	1.211	22 26 51.1	0.20	22 26.5	12	18 9 24.84	0.951	22 26 19.8	0.23	20 38.0
13	17 56 17.65	1.206	22 26 55.6	0.18	22 23.0	13	18 9 47.51	0.940	22 26 14.2	0.24	20 34.5
14	17 56 46.51	1.200	22 26 59.6	0.16	22 19.6	14	18 10 9.90	0.928	22 26 8.4	0.25	20 30.9
15	17 57 15.24	1.194	22 27 3.2	0.14	22 16.1	15	18 10 32.02	0.916	22 26 2.4	0.26	20 27.4
16	17 57 43.83	+1.188	−22 27 6.4	−0.12	22 12.7	16	18 10 53.85	+0.904	−22 25 56.2	+0.26	20 23.8
17	17 58 12.27	1.182	22 27 9.2	0.11	22 9.2	17	18 11 15.39	0.892	22 25 49.9	0.27	20 20.2
18	17 58 40.57	1.176	22 27 11.7	0.09	22 5.8	18	18 11 36.63	0.880	22 25 43.4	0.27	20 16.6
19	17 59 8.71	1.170	22 27 13.7	0.07	22 2.3	19	18 11 57.58	0.867	22 25 36.7	0.28	20 13.0
20	17 59 36.69	1.163	22 27 15.3	0.06	21 58.8	20	18 12 18.23	0.854	22 25 29.9	0.28	20 9.4
21	18 0 4.51	+1.156	−22 27 16.5	−0.04	21 55.3	21	18 12 38.57	+0.841	−22 25 23.0	+0.29	20 5.8
22	18 0 32.16	1.149	22 27 17.3	0.03	21 51.9	22	18 12 58.59	0.828	22 25 16.0	0.29	20 2.2
23	18 0 59.64	1.142	22 27 17.7	−0.01	21 48.4	23	18 13 18.30	0.815	22 25 8.9	0.30	19 58.6
24	18 1 26.94	1.134	22 27 17.8	+0.01	21 44.9	24	18 13 37.69	0.802	22 25 1.7	0.30	19 55.0
25	18 1 54.05	1.126	22 27 17.5	0.02	21 41.4	25	18 13 56.75	0.788	22 24 54.4	0.31	19 51.4
26	18 2 20.98	+1.118	−22 27 16.9	+0.04	21 37.9	26	18 14 15.48	+0.774	−22 24 47.0	+0.31	19 47.7
27	18 2 47.71	1.110	22 27 15.9	0.05	21 34.4	27	18 14 33.89	0.760	22 24 39.5	0.31	19 44.1
28	18 3 14.24	1.102	22 27 14.6	0.07	21 30.9	28	18 14 51.95	0.746	22 24 32.0	0.31	19 40.5
29	18 3 40.57	1.094	22 27 13.0	0.08	21 27.4	29	18 15 9.67	0.732	22 24 24.4	0.32	19 36.9
30	18 4 6.69	1.085	22 27 11.0	0.09	21 23.9	30	18 15 27.04	0.717	22 24 16.8	0.32	19 33.2
31	18 4 32.59	+1.076	−22 27 8.7	+0.10	21 20.4	31	18 15 44.07	+0.702	−22 24 9.2	+0.32	19 29.6
32	18 4 58.27	+1.067	−22 27 6.1	+0.11	21 16.9	32	18 16 0.74	+0.687	−22 24 1.5	+0.32	19 25.9

Day of the Month.	2d.	10th.	18th.	26th.	Day of the Month.	3d.	11th.	19th.	27th.
	″	″	″	″		″	″	″	″
Semidiameter	7.1	7.1	7.2	7.2	Semidiameter	7.3	7.3	7.4	7.5
Horizontal Parallax . .	0.8	0.8	0.8	0.8	Horizontal Parallax . .	0.8	0.8	0.8	0.8

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	18 15 9.67	+0.732	−22 24 24.4	+0.32	19 36.9	1	18 21 12.40	+0.227	−22 20 56.6	+0.19	17 40.8
2	18 15 27.04	0.717	22 24 16.8	0.32	19 33.2	2	18 21 17.63	0.209	22 20 52.2	0.18	17 37.0
3	18 15 44.07	0.702	22 24 9.2	0.32	19 29.6	3	18 21 22.44	0.192	22 20 48.0	0.17	17 33.1
4	18 16 0.74	0.687	22 24 1.5	0.32	19 25.9	4	18 21 26.82	0.174	22 20 44.0	0.16	17 29.2
5	18 16 17.05	0.672	22 23 53.8	0.32	19 22.2	5	18 21 30.77	0.156	22 20 40.3	0.15	17 25.4
6	18 16 33.00	+0.657	−22 23 46.2	+0.32	19 18.5	6	18 21 34.30	+0.139	−22 20 36.8	+0.14	17 21.5
7	18 16 48.59	0.642	22 23 38.6	0.32	19 14.9	7	18 21 37.40	0.121	22 20 33.5	0.13	17 17.6
8	18 17 3.82	0.627	22 23 31.0	0.32	19 11.2	8	18 21 40.08	0.103	22 20 30.5	0.12	17 13.7
9	18 17 18.67	0.612	22 23 23.4	0.32	19 7.5	9	18 21 42.33	0.085	22 20 27.6	0.11	17 9.8
10	18 17 33.15	0.596	22 23 15.9	0.32	19 3.8	10	18 21 44.15	0.067	22 20 25.0	0.10	17 5.9
11	18 17 47.26	+0.580	−22 23 8.4	+0.31	19 0.1	11	18 21 45.55	+0.049	−22 20 22.7	+0.09	17 2.0
12	18 18 0.99	0.564	22 23 1.0	0.31	18 56.4	12	18 21 46.52	0.032	22 20 20.6	0.08	16 58.1
13	18 18 14.34	0.548	22 22 53.6	0.31	18 52.7	13	18 21 47.07	+0.014	22 20 18.7	0.07	16 54.1
14	18 18 27.31	0.532	22 22 46.3	0.30	18 48.9	14	18 21 47.20	−0.003	22 20 17.1	0.06	16 50.2
15	18 18 39.89	0.516	22 22 39.1	0.30	18 45.2	15	18 21 46.90	0.021	22 20 15.8	0.05	16 46.3
16	18 18 52.09	+0.500	−22 22 31.9	+0.29	18 41.5	16	18 21 46.18	−0.038	−22 20 14.7	+0.04	16 42.3
17	18 19 3.89	0.484	22 22 24.9	0.29	18 37.8	17	18 21 45.04	0.056	22 20 13.9	0.03	16 38.4
18	18 19 15.30	0.468	22 22 18.0	0.28	18 34.0	18	18 21 43.48	0.074	22 20 13.3	0.02	16 34.4
19	18 19 26.32	0.452	22 22 11.2	0.28	18 30.3	19	18 21 41.49	0.091	22 20 13.0	+0.01	16 30.4
20	18 19 36.94	0.435	22 22 4.5	0.27	18 26.5	20	18 21 39.08	0.109	22 20 12.9	−0.01	16 26.5
21	18 19 47.16	+0.418	−22 21 57.9	+0.27	18 22.7	21	18 21 36.26	−0.126	−22 20 13.1	−0.02	16 22.5
22	18 19 56.97	0.401	22 21 51.5	0.26	18 18.9	22	18 21 33.02	0.144	22 20 13.5	0.03	16 18.5
23	18 20 6.38	0.384	22 21 45.2	0.26	18 15.1	23	18 21 29.36	0.162	22 20 14.3	0.04	16 14.5
24	18 20 15.38	0.367	22 21 39.1	0.26	18 11.4	24	18 21 25.29	0.179	22 20 15.3	0.05	16 10.5
25	18 20 23.97	0.350	22 21 33.1	0.25	18 7.6	25	18 21 20.80	0.196	22 20 16.5	0.06	16 6.5
26	18 20 32.15	+0.333	−22 21 27.3	+0.24	18 3.8	26	18 21 15.90	−0.213	−22 20 17.9	−0.07	16 2.5
27	18 20 39.91	0.315	22 21 21.7	0.23	18 0.0	27	18 21 10.60	0.230	22 20 19.7	0.08	15 58.4
28	18 20 47.25	0.297	22 21 16.3	0.22	17 56.1	28	18 21 4.89	0.247	22 20 21.7	0.09	15 54.4
29	18 20 54.17	0.280	22 21 11.1	0.22	17 52.3	29	18 20 58.77	0.264	22 20 24.0	0.10	15 50.4
30	18 21 0.67	0.262	22 21 6.1	0.21	17 48.5	30	18 20 52.25	0.280	22 20 26.5	0.11	15 46.3
31	18 21 6.75	+0.244	−22 21 1.2	+0.20	17 44.7	31	18 20 45.34	−0.296	−22 20 29.2	−0.12	15 42.3
32	18 21 12.40	+0.227	−22 20 56.6	+0.19	17 40.8	32	18 20 38.04	−0.312	−22 20 32.2	−0.13	15 38.2

Day of the Month.	7th.	15th.	23d.	31st.	Day of the Month.	8th.	16th.	24th.
	″	″	″	″		″	″	″
Semidiameter	7.6	7.7	7.8	7.9	Semidiameter	8.0	8.1	8.2
Horizontal Parallax . .	0.9	0.9	0.9	0.9	Horizontal Parallax	0.9	0.9	0.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	18 20 45.34	−0.296	−22 20 29.2	−0.12	15 42.3	1	18 14 20.67	−0.698	−22 23 30.9	−0.33	13 33.9
2	18 20 38.04	0.312	22 20 32.2	0.13	15 38.2	2	18 14 3.81	0.706	22 23 38.9	0.33	13 29.7
3	18 20 30.34	0.328	22 20 35.4	0.13	15 34.2	3	18 13 46.74	0.714	22 23 47.0	0.33	13 25.5
4	18 20 22.26	0.344	22 20 38.9	0.14	15 30.1	4	18 13 29.48	0.721	22 23 55.1	0.33	13 21.3
5	18 20 13.81	0.360	22 20 42.6	0.15	15 26.0	5	18 13 12.06	0.728	22 24 3.3	0.34	13 17.0
6	18 20 4.98	−0.376	−22 20 46.5	−0.16	15 21.9	6	18 12 54.47	−0.734	−22 24 11.5	−0.34	13 12.8
7	18 19 55.78	0.391	22 20 50.6	0.17	15 17.8	7	18 12 36.71	0.741	22 24 19.8	0.34	13 8.6
8	18 19 46.22	0.406	22 20 54.9	0.18	15 13.7	8	18 12 18.80	0.748	22 24 28.1	0.34	13 4.3
9	18 19 36.29	0.421	22 20 59.5	0.19	15 9.6	9	18 12 0.75	0.754	22 24 36.4	0.34	13 0.1
10	18 19 26.00	0.436	22 21 4.3	0.20	15 5.5	10	18 11 42.57	0.760	22 24 44.8	0.35	12 55.9
11	18 19 15.36	−0.451	−22 21 9.3	−0.21	15 1.4	11	18 11 24.25	−0.766	−22 24 53.2	−0.35	12 51.7
12	18 19 4.38	0.465	22 21 14.5	0.22	14 57.3	12	18 11 5.82	0.771	22 25 1.6	0.35	12 47.4
13	18 18 53.06	0.479	22 21 19.8	0.23	14 53.2	13	18 10 47.29	0.775	22 25 10.0	0.35	12 43.2
14	18 18 41.40	0.493	22 21 25.3	0.24	14 49.0	14	18 10 28.66	0.779	22 25 18.4	0.35	12 38.9
15	18 18 29.41	0.507	22 21 31.0	0.25	14 44.9	15	18 10 9.92	0.782	22 25 26.8	0.35	12 34.7
16	18 18 17.10	−0.520	−22 21 36.9	−0.26	14 40.8	16	18 9 51.10	−0.785	−22 25 35.2	−0.35	12 30.4
17	18 18 4.46	0.533	22 21 43.0	0.26	14 36.6	17	18 9 32.22	0.788	22 25 43.6	0.35	12 26.2
18	18 17 51.50	0.546	22 21 49.2	0.27	14 32.5	18	18 9 13.28	0.791	22 25 52.0	0.35	12 22.0
19	18 17 38.24	0.559	22 21 55.6	0.28	14 28.3	19	18 8 54.29	0.793	22 26 0.5	0.35	12 17.7
20	18 17 24.68	0.572	22 22 2.2	0.28	14 24.2	20	18 8 35.24	0.794	22 26 8.9	0.35	12 13.5
21	18 17 10.82	−0.584	−22 22 8.9	−0.29	14 20.1	21	18 8 16.17	−0.795	−22 26 17.3	−0.35	12 9.2
22	18 16 56.66	0.596	22 22 15.8	0.29	14 15.9	22	18 7 57.07	0.795	22 26 25.7	0.35	12 5.0
23	18 16 42.21	0.607	22 22 22.8	0.29	14 11.7	23	18 7 37.95	0.796	22 26 34.1	0.35	12 0.7
24	18 16 27.49	0.618	22 22 29.9	0.30	14 7.5	24	18 7 18.82	0.796	22 26 42.4	0.35	11 56.5
25	18 16 12.51	0.629	22 22 37.1	0.30	14 3.3	25	18 6 59.70	0.795	22 26 50.7	0.35	11 52.2
26	18 15 57.26	−0.640	−22 22 44.5	−0.31	13 59.1	26	18 6 40.61	−0.795	−22 26 59.0	−0.35	11 48.0
27	18 15 41.75	0.651	22 22 52.0	0.31	13 54.9	27	18 6 21.53	0.794	22 27 7.3	0.35	11 43.7
28	18 15 26.00	0.661	22 22 59.6	0.31	13 50.7	28	18 6 2.49	0.793	22 27 15.5	0.35	11 39.5
29	18 15 10.01	0.671	22 23 7.3	0.32	13 46.5	29	18 5 43.50	0.791	22 27 23.7	0.34	11 35.2
30	18 14 53.78	0.680	22 23 15.0	0.32	13 42.3	30	18 5 24.56	0.788	22 27 31.8	0.34	11 30.9
31	18 14 37.33	−0.689	−22 23 22.9	−0.33	13 38.1	31	18 5 5.68	−0.785	−22 27 39.9	−0.34	11 26.7
32	18 14 20.67	−0.698	−22 23 30.9	−0.33	13 33.9	32	18 4 46.88	−0.781	−22 27 47.9	−0.34	11 22.4

Day of the Month.	2d.	10th.	18th.	26th.	Day of the Month.	3d.	11th.	19th.	27th.
	″	″	″	″		″	″	″	″
Semidiameter	8.3	8.4	8.5	8.5	Semidiameter	8.6	8.6	8.6	8.6
Horizontal Parallax . .	0.9	1.0	1.0	1.0	Horizontal Parallax . .	1.0	1.0	1.0	1.0

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	18 5 5.68	−0.785	−22 27 39.9	−0.34	11 26.7	1	17 56 41.34	−0.517	−22 31 37.3	−0.32	9 16.5
2	18 4 46.88	0.781	22 27 47.9	0.34	11 22.4	2	17 56 29.08	0.504	22 31 44.9	0.32	9 12.4
3	18 4 28.17	0.777	22 27 55.9	0.34	11 18.2	3	17 56 17.15	0.490	22 31 52.5	0.32	9 8.3
4	18 4 9.56	0.773	22 28 3.9	0.34	11 14.0	4	17 56 5.56	0.476	22 32 0.2	0.32	9 4.1
5	18 3 51.04	0.769	22 28 11.9	0.33	11 9.7	5	17 55 54.31	0.462	22 32 7.9	0.32	9 0.0
6	18 3 32.63	−0.764	−22 28 19.8	−0.33	11 5.5	6	17 55 43.40	−0.448	−22 32 15.6	−0.32	8 55.9
7	18 3 14.36	0.759	22 28 27.6	0.33	11 1.3	7	17 55 32.83	0.433	22 32 23.4	0.32	8 51.8
8	18 2 56.22	0.753	22 28 35.4	0.33	10 57.0	8	17 55 22.62	0.418	22 32 31.2	0.33	8 47.7
9	18 2 38.21	0.747	22 28 43.2	0.33	10 52.8	9	17 55 12.77	0.403	22 32 39.1	0.33	8 43.6
10	18 2 20.35	0.741	22 28 50.9	0.33	10 48.6	10	17 55 3.29	0.388	22 32 47.0	0.33	8 39.5
11	18 2 2.65	−0.734	−22 28 58.6	−0.32	10 44.4	11	17 54 54.16	−0.373	−22 32 55.0	−0.33	8 35.4
12	18 1 45.12	0.727	22 29 6.3	0.32	10 40.1	12	17 54 45.40	0.358	22 33 3.1	0.33	8 31.4
13	18 1 27.75	0.719	22 29 14.0	0.32	10 35.9	13	17 54 37.02	0.342	22 33 11.2	0.34	8 27.3
14	18 1 10.56	0.711	22 29 21.6	0.32	10 31.7	14	17 54 29.01	0.326	22 33 19.3	0.34	8 23.2
15	18 0 53.57	0.703	22 29 29.2	0.32	10 27.5	15	17 54 21.38	0.310	22 33 27.5	0.34	8 19.2
16	18 0 36.78	−0.695	−22 29 36.8	−0.32	10 23.3	16	17 54 14.14	−0.294	−22 33 35.8	−0.34	8 15.1
17	18 0 20.19	0.686	22 29 44.4	0.32	10 19.1	17	17 54 7.28	0.278	22 33 44.1	0.35	8 11.1
18	18 0 3.81	0.677	22 29 52.0	0.32	10 14.9	18	17 54 0.81	0.262	22 33 52.5	0.35	8 7.1
19	17 59 47.66	0.668	22 29 59.6	0.32	10 10.7	19	17 53 54.74	0.245	22 34 1.0	0.35	8 3.0
20	17 59 31.74	0.659	22 30 7.1	0.31	10 6.5	20	17 53 49.07	0.228	22 34 9.6	0.36	7 59.0
21	17 59 16.04	−0.649	−22 30 14.6	−0.31	10 2.3	21	17 53 43.80	−0.211	−22 34 18.2	−0.36	7 55.0
22	17 59 0.59	0.639	22 30 22.1	0.31	9 58.1	22	17 53 38.92	0.194	22 34 26.9	0.36	7 51.0
23	17 58 45.40	0.628	22 30 29.6	0.31	9 53.9	23	17 53 34.46	0.177	22 34 35.7	0.36	7 47.0
24	17 58 30.47	0.617	22 30 37.1	0.31	9 49.8	24	17 53 30.41	0.160	22 34 44.5	0.37	7 43.0
25	17 58 15.81	0.606	22 30 44.6	0.31	9 45.6	25	17 53 26.77	0.143	22 34 53.4	0.37	7 39.0
26	17 58 1.42	−0.594	−22 30 52.1	−0.31	9 41.4	26	17 53 23.55	−0.126	−22 35 2.3	−0.37	7 35.0
27	17 57 47.32	0.582	22 30 59.6	0.31	9 37.3	27	17 53 20.74	0.109	22 35 11.4	0.37	7 31.0
28	17 57 33.52	0.569	22 31 7.1	0.31	9 33.1	28	17 53 18.35	0.092	22 35 20.5	0.38	7 27.1
29	17 57 20.01	0.556	22 31 14.6	0.32	9 29.0	29	17 53 16.38	0.074	22 35 29.7	0.38	7 23.1
30	17 57 6.80	0.543	22 31 22.1	0.32	9 24.8	30	17 53 14.84	0.056	22 35 38.9	0.38	7 19.2
31	17 56 53.91	−0.530	−22 31 29.7	−0.32	9 20.7	31	17 53 13.71	−0.039	−22 35 48.2	−0.38	7 15.2
32	17 56 41.34	−0.517	−22 31 37.3	−0.32	9 16.5	32	17 53 13.00	−0.021	−22 35 57.6	−0.39	7 11.3

Day of the Month.	5th.	13th.	21st.	29th.	Day of the Month.	6th.	14th.	22d.	30th.
	″	″	″	″		″	″	″	″
Semidiameter	8.6	8.6	8.5	8.5	Semidiameter	8.4	8.3	8.2	8.1
Horizontal Parallax . .	1.0	1.0	1.0	1.0	Horizontal Parallax . .	0.9	0.9	0.9	0.9

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing. The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 53 13.00	−0.021	−22 35 57.6	−0.39	7 11.3
2	17 53 12.72	−0.004	22 36 7.0	0.39	7 7.3
3	17 53 12.86	+0.014	22 36 16.6	0.40	7 3.4
4	17 53 13.43	0.032	22 36 26.2	0.40	6 59.5
5	17 53 14.42	0.050	22 36 35.9	0.40	6 55.6
6	17 53 15.83	+0.067	−22 36 45.6	−0.41	6 51.7
7	17 53 17.65	0.085	22 36 55.4	0.41	6 47.8
8	17 53 19.90	0.102	22 37 5.2	0.41	6 43.9
9	17 53 22.57	0.120	22 37 15.1	0.42	6 40.0
10	17 53 25.66	0.138	22 37 25.1	0.42	6 36.1
11	17 53 29.18	+0.155	−22 37 35.1	−0.42	6 32.2
12	17 53 33.12	0.173	22 37 45.1	0.42	6 28.4
13	17 53 37.48	0.190	22 37 55.2	0.42	6 24.5
14	17 53 42.25	0.208	22 38 5.3	0.42	6 20.7
15	17 53 47.44	0.226	22 38 15.5	0.42	6 16.8
16	17 53 53.05	+0.243	−22 38 25.7	−0.42	6 13.0
17	17 53 59.08	0.261	22 38 35.9	0.43	6 9.2
18	17 54 5.53	0.278	22 38 46.1	0.43	6 5.3
19	17 54 12.39	0.295	22 38 56.4	0.43	6 1.5
20	17 54 19.67	0.312	22 39 6.6	0.43	5 57.7
21	17 54 27.36	+0.329	−22 39 16.9	−0.43	5 53.9
22	17 54 35.46	0.346	22 39 27.2	0.43	5 50.1
23	17 54 43.98	0.363	22 39 37.5	0.43	5 46.3
24	17 54 52.90	0.380	22 39 47.7	0.43	5 42.5
25	17 55 2.23	0.397	22 39 57.9	0.43	5 38.7
26	17 55 11.97	+0.414	−22 40 8.1	−0.43	5 34.9
27	17 55 22.12	0.431	22 40 18.3	0.42	5 31.2
28	17 55 32.67	0.448	22 40 28.4	0.42	5 27.4
29	17 55 43.61	0.464	22 40 38.5	0.42	5 23.7
30	17 55 54.94	0.481	22 40 48.6	0.42	5 19.9
31	17 56 6.67	+0.497	−22 40 58.6	−0.42	5 16.2
32	17 56 18.79	+0.513	−22 41 8.5	−0.41	5 12.5

Day of the Month.	7th.	15th.	23d.
	″	″	″
Semidiameter	8.0	7.9	7.8
Horizontal Parallax	0.9	0.9	0.9

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 56 6.67	+0.497	−22 40 58.6	−0.42	5 16.2
2	17 56 18.79	0.513	22 41 8.5	0.41	5 12.5
3	17 56 31.29	0.529	22 41 18.3	0.41	5 8.8
4	17 56 44.18	0.545	22 41 28.1	0.41	5 5.1
5	17 56 57.45	0.561	22 41 37.9	0.40	5 1.4
6	17 57 11.09	+0.577	−22 41 47.6	−0.40	4 57.7
7	17 57 25.10	0.592	22 41 57.2	0.40	4 54.0
8	17 57 39.49	0.607	22 42 6.6	0.39	4 50.3
9	17 57 54.25	0.622	22 42 15.9	0.39	4 46.6
10	17 58 9.37	0.637	22 42 25.1	0.38	4 42.9
11	17 58 24.85	+0.652	−22 42 34.2	−0.38	4 39.2
12	17 58 40.69	0.667	22 42 43.2	0.37	4 35.5
13	17 58 56.89	0.682	22 42 52.0	0.37	4 31.9
14	17 59 13.44	0.697	22 43 0.6	0.36	4 28.2
15	17 59 30.34	0.712	22 43 9.1	0.35	4 24.6
16	17 59 47.58	+0.726	−22 43 17.5	−0.35	4 20.9
17	18 0 5.17	0.740	22 43 25.7	0.34	4 17.3
18	18 0 23.10	0.754	22 43 33.7	0.33	4 13.6
19	18 0 41.37	0.768	22 43 41.5	0.32	4 10.0
20	18 0 59.97	0.782	22 43 49.1	0.31	4 6.4
21	18 1 18.90	+0.796	−22 43 56.6	−0.30	4 2.8
22	18 1 38.16	0.810	22 44 3.8	0.30	3 59.2
23	18 1 57.74	0.823	22 44 10.8	0.29	3 55.6
24	18 2 17.64	0.836	22 44 17.6	0.28	3 52.0
25	18 2 37.85	0.849	22 44 24.1	0.27	3 48.4
26	18 2 58.37	+0.862	−22 44 30.4	−0.26	3 44.8
27	18 3 19.19	0.875	22 44 36.4	0.25	3 41.2
28	18 3 40.32	0.887	22 44 42.2	0.24	3 37.6
29	18 4 1.75	0.899	22 44 47.7	0.22	3 34.1
30	18 4 23.47	0.911	22 44 53.0	0.21	3 30.5
31	18 4 45.47	+0.923	−22 44 58.0	−0.20	3 26.9
32	18 5 7.75	+0.935	−22 45 2.7	−0.19	3 23.3

Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″	″
Semidiameter	7.7	7.6	7.5	7.4
Horizontal Parallax . .	0.9	0.9	0.8	0.8

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	18 5 7.75	+0.935	−22 45 2.7	−0.19	3 23.3	1	18 18 5.81	+1.198	−22 44 40.0	+0.28	1 38.3
2	18 5 30.32	0.946	22 45 7.1	0.18	3 19.8	2	18 18 34.62	1.204	22 44 32.9	0.30	1 34.9
3	18 5 53.16	0.957	22 45 11.2	0.16	3 16.2	3	18 19 3.57	1.209	22 44 25.4	0.32	1 31.4
4	18 6 16.26	0.968	22 45 15.0	0.15	3 12.7	4	18 19 32.65	1.214	22 44 17.5	0.34	1 28.0
5	18 6 39.62	0.979	22 45 18.5	0.14	3 9.1	5	18 20 1.85	1.219	22 44 9.1	0.36	1 24.5
6	18 7 3.25	+0.990	−22 45 21.7	−0.13	3 5.6	6	18 20 31.16	+1.224	−22 44 0.2	+0.38	1 21.1
7	18 7 27.14	1.001	22 45 24.6	0.12	3 2.0	7	18 21 0.59	1.229	22 43 50.9	0.40	1 17.6
8	18 7 51.27	1.011	22 45 27.1	0.10	2 58.5	8	18 21 30.13	1.233	22 43 41.1	0.42	1 14.2
9	18 8 15.65	1.021	22 45 29.3	0.09	2 55.0	9	18 21 59.77	1.237	22 43 30.9	0.44	1 10.7
10	18 8 40.28	1.031	22 45 31.2	0.08	2 51.5	10	18 22 29.51	1.241	22 43 20.2	0.46	1 7.3
11	18 9 5.15	+1.041	−22 45 32.7	−0.07	2 48.0	11	18 22 59.35	+1.245	−22 43 9.0	+0.47	1 3.8
12	18 9 30.25	1.051	22 45 33.8	0.05	2 44.5	12	18 23 29.29	1.249	22 42 57.3	0.49	1 0.4
13	18 9 55.58	1.060	22 45 34.6	0.03	2 41.0	13	18 23 59.31	1.252	22 42 45.2	0.51	0 56.9
14	18 10 21.14	1.069	22 45 35.0	−0.01	2 37.5	14	18 24 29.41	1.255	22 42 32.6	0.53	0 53.5
15	18 10 46.93	1.078	22 45 35.0	+0.01	2 34.0	15	18 24 59.58	1.258	22 42 19.5	0.55	0 50.1
16	18 11 12.93	+1.087	−22 45 34.6	+0.02	2 30.5	16	18 25 29.83	+1.261	−22 42 6.0	+0.57	0 46.7
17	18 11 39.14	1.096	22 45 33.9	0.04	2 27.0	17	18 26 0.15	1.264	22 41 52.1	0.59	0 43.2
18	18 12 5.56	1.105	22 45 32.8	0.05	2 23.5	18	18 26 30.52	1.266	22 41 37.7	0.61	0 39.8
19	18 12 32.19	1.113	22 45 31.3	0.07	2 20.0	19	18 27 0.94	1.268	22 41 22.8	0.63	0 36.4
20	18 12 59.02	1.121	22 45 29.4	0.08	2 16.5	20	18 27 31.42	1.270	22 41 7.5	0.65	0 33.0
21	18 13 26.04	+1.129	−22 45 27.0	+0.10	2 13.0	21	18 28 1.95	+1.272	−22 40 51.7	+0.67	0 29.5
22	18 13 53.25	1.137	22 45 24.2	0.12	2 9.5	22	18 28 32.51	1.274	22 40 35.5	0.69	0 26.1
23	18 14 20.65	1.145	22 45 21.0	0.14	2 6.0	23	18 29 3.10	1.276	22 40 18.8	0.71	0 22.7
24	18 14 48.22	1.152	22 45 17.4	0.15	2 2.5	24	18 29 33.73	1.277	22 40 1.6	0.73	0 19.3
25	18 15 15.96	1.159	22 45 13.4	0.17	1 59.0	25	18 30 4.38	1.278	22 39 44.0	0.75	0 15.8
26	18 15 43.88	+1.166	−22 45 8.9	+0.19	1 55.6	26	18 30 35.04	+1.278	−22 39 26.0	+0.77	0 12.4
27	18 16 11.96	1.173	22 45 4.0	0.21	1 52.1	27	18 31 5.71	1.279	22 39 7.6	0.79	0 9.0
28	18 16 40.20	1.180	22 44 58.7	0.23	1 48.7	28	18 31 36.40	1.279	22 38 48.7	0.80	0 5.6
29	18 17 8.59	1.186	22 44 52.9	0.24	1 45.2	29	18 32 7.08	1.279	22 38 29.4	0.82	0 2.2 23 58.8
30	18 17 37.13	1.192	22 44 46.7	0.26	1 41.8	30	18 32 37.76	1.278	22 38 9.7	0.83	23 55.3
31	18 18 5.81	+1.198	−22 44 40.0	+0.28	1 38.3	31	18 33 8.43	+1.278	−22 37 49.6	+0.85	23 51.9
32	18 18 34.62	+1.204	−22 44 32.9	+0.30	1 34.9	32	18 33 39.09	+1.277	−22 37 29.1	+0.86	23 48.5

Day of the Month.	2d.	10th.	18th.	26th.	Day of the Month.	4th.	12th.	20th.	28th.	36th.
	″	″	″	″		″	″	″	″	″
Semidiameter	7.3	7.3	7.2	7.2	Semidiameter	7.1	7.1	7.1	7.1	7.1
Horizontal Parallax . .	0.8	0.8	0.8	0.8	Horizontal Parallax .	0.8	0.8	0.8	0.8	0.8

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing and south declinations are decreasing The sign — indicates that north declinations are decreasing and south declinations increasing.

GREENWICH MEAN TIME.

Day and Month.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Day and Month.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 2	16 34 25.31	+14.000	−21 55 50.6	−29.05	21 44.4	July 1	16 30 33.98	− 8.651	−21 49 15.4	+17.76	9 52.5
6	16 35 20.44	13.555	21 57 44.4	27.84	21 29.6	5	16 30 0.41	8.126	21 48 6.3	16.76	9 36.3
10	16 36 13.69	13.062	21 59 33.2	26.56	21 14.7	9	16 29 29.04	7.553	21 47 1.5	15.62	9 20.0
14	16 37 4.89	12.530	22 1 16.8	25.23	20 59.8	13	16 29 0.05	6.933	21 46 1.5	14.34	9 3.8
18	16 37 53.87	11.952	22 2 55.0	23.85	20 44.9	17	16 28 33.63	6.272	21 45 6.9	12.96	8 47.7
22	16 38 40.45	+11.332	−22 4 27.5	−22.41	20 29.9	21	16 28 9.93	− 5.569	−21 44 18.0	+11.48	8 31.5
26	16 39 24.47	10.670	22 5 54.2	20.93	20 14.9	25	16 27 49.13	4.824	21 43 35.2	9.89	8 15.5
30	16 40 5.75	9.964	22 7 14.9	19.42	19 59.9	29	16 27 31.38	4.046	21 42 59.0	8.21	7 59.5
Feb. 3	16 40 44.13	9.219	22 8 29.5	17.87	19 44.8	Aug. 2	16 27 16.80	3.240	21 42 29.6	6.47	7 43.5
7	16 41 19.46	8.441	22 9 37.8	16.28	19 29.6	6	16 27 5.49	2.412	21 42 7.3	4.66	7 27.6
11	16 41 51.62	+ 7.637	−22 10 39.7	−14.67	19 14.4	10	16 26 57.52	− 1.572	−21 41 52.4	+ 2.78	7 11.7
15	16 42 20.52	6.809	22 11 35.1	13.02	18 59.2	14	16 26 52.93	− 0.716	21 41 45.1	+ 0.88	6 55.9
19	16 42 46.06	5.957	22 12 23.9	11.38	18 43.9	18	16 26 51.79	+ 0.152	21 41 45.4	− 1.04	6 40.2
23	16 43 8.14	5.079	22 13 6.1	9.71	18 28.5	22	16 26 54.13	1.025	21 41 53.4	2.97	6 24.5
27	16 43 26.67	4.184	22 13 41.6	8.04	18 13.0	26	16 27 0.00	1.909	21 42 9.2	4.91	6 8.9
Mar. 3	16 43 41.59	+ 3.273	−22 14 10.4	− 6.36	17 57.5	30	16 27 9.40	+ 2.789	−21 42 32.7	− 6.84	5 53.3
7	16 43 52.85	2.356	22 14 32.5	4.69	17 42.0	Sept. 3	16 27 22.30	3.659	21 43 3.9	8.75	5 37.8
11	16 44 0.44	1.440	22 14 47.9	3.02	17 26.4	7	16 27 38.66	4.518	21 43 42.6	10.62	5 22.3
15	16 44 4.37	+ 0.527	22 14 56.7	− 1.37	17 10.7	11	16 27 58.43	5.364	21 44 28.7	12.44	5 6.9
19	16 44 4.66	− 0.379	22 14 58.9	+ 0.28	16 55.0	15	16 28 21.55	6.195	21 45 22.0	14.20	4 51.6
23	16 44 1.34	− 1.279	−22 14 54.5	+ 1.91	16 39.2	19	16 28 47.97	+ 7.012	−21 46 22.2	−15.90	4 36.3
27	16 43 54.44	2.168	22 14 43.6	3.52	16 23.3	23	16 29 17.62	7.809	21 47 29.1	17.54	4 21.1
31	16 43 44.02	3.037	22 14 26.4	5.09	16 7.4	27	16 29 50.41	8.582	21 48 42.4	19.08	4 5.9
Apr. 4	16 43 30.18	3.878	22 14 2.9	6.64	15 51.5	Oct. 1	16 30 26.23	9.320	21 50 1.6	20.52	3 50.8
8	16 43 13.04	4.685	22 13 33.3	8.14	15 35.4	5	16 31 4.94	10.026	21 51 26.4	21.87	3 35.7
12	16 42 52.75	− 5.455	−22 12 57.8	+ 9.59	15 19.4	9	16 31 46.41	+10.702	−21 52 56.4	−23.12	3 20.7
16	16 42 29.45	6.187	22 12 16.6	11.00	15 3.3	13	16 32 30.51	11.344	21 54 31.2	24.27	3 5.7
20	16 42 3.31	6.876	22 11 29.9	12.32	14 47.1	17	16 33 17.12	11.955	21 56 10.4	25.32	2 50.7
24	16 41 34.50	7.522	22 10 38.1	13.59	14 30.9	21	16 34 6.10	12.527	21 57 53.5	26.25	2 35.8
28	16 41 3.20	8.117	22 9 41.3	14.79	14 14.6	25	16 34 57.28	13.056	21 59 40.2	27.06	2 20.9
May 2	16 40 29.64	− 8.652	−22 8 39.9	+15.90	13 58.3	29	16 35 50.49	+13.540	−22 1 29.8	−27.75	2 6.1
6	16 39 54.07	9.122	22 7 34.2	16.92	13 42.0	Nov. 2	16 36 45.54	13.976	22 3 22.0	28.32	1 51.3
10	16 39 16.75	9.528	22 6 24.7	17.83	13 25.7	6	16 37 42.24	14.367	22 5 16.2	28.77	1 36.5
14	16 38 37.93	9.871	22 5 11.7	18.63	13 9.3	10	16 38 40.42	14.715	22 7 12.0	29.11	1 21.7
18	16 37 57.87	10.150	22 3 55.8	19.32	12 52.9	14	16 39 39.90	15.018	22 9 8.9	29.33	1 7.0
22	16 37 16.82	−10.364	−22 2 37.3	+19.88	12 36.5	18	16 40 40.50	+15.272	−22 11 6.5	−29.44	0 52.2
26	16 36 35.05	10.509	22 1 16.9	20.32	12 20.1	22	16 41 42.01	15.474	22 13 4.3	29.44	0 37.5
30	16 35 52.85	10.577	21 59 54.9	20.64	12 3.6	26	16 42 44.22	15.623	22 15 1.9	29.33	0 22.8
June 3	16 35 10.53	10.572	21 58 32.0	20.79	11 47.2	30	16 43 46.92	15.718	22 16 58.8	29.12	0 8.2
7	16 34 28.37	10.494	21 57 8.8	20.80	11 30.8	Dec. 4	16 44 49.89	15.760	22 18 54.7	28.82	23 49.8
11	16 33 46.67	−10.347	−21 55 45.8	+20.66	11 14.4	8	16 45 52.93	+15.752	−22 20 49.2	−28.40	23 35.1
15	16 33 5.68	10.138	21 54 23.7	20.37	10 58.0	12	16 46 55.84	15.694	22 22 41.8	27.90	23 20.4
19	16 32 25.65	9.865	21 53 3.0	19.95	10 41.6	16	16 47 58.42	15.587	22 24 32.3	27.33	23 5.7
23	16 31 46.85	9.525	21 51 44.3	19.37	10 25.2	20	16 49 0.46	15.422	22 26 20.3	26.66	22 51.0
27	16 31 9.54	9.119	21 50 28.2	18.63	10 8.9	24	16 50 1.72	15.200	22 28 5.5	25.92	22 36.3
July 1	16 30 33.98	− 8.651	−21 49 15.4	+17.76	9 52.5	28	16 51 1.99	+14.925	−22 29 47.6	−25.11	22 21.6
5	16 30 0.41	− 8.126	−21 48 6.3	+16.76	9 36.3	32	16 52 1.05	+14.598	−22 31 26.3	−24.23	22 6.8

Greatest semidiameter,	June 1, 1″.86	Greatest horizontal parallax,	June 1, 0″.50
Least semidiameter,	December 5, 1″.67	Least horizontal parallax,	December 5, 0″.44

NEPTUNE, 1900.

GREENWICH MEAN TIME.

Day and Month.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Day and Month.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 2	5 39 10.86	−6.984	+22 3 55.7	−2.21	10 50.7	July 1	5 47 54.16	+9.495	+22 13 39.8	+2.75	23 7.9
6	5 38 43.34	6.772	22 3 47.3	1.99	10 34.5	5	5 48 31.91	9.374	22 13 50.2	2.44	22 52.8
10	5 38 16.74	6.517	22 3 39.8	1.74	10 18.3	9	5 49 9.11	9.221	22 13 59.3	2.11	22 37.7
14	5 37 51.26	6.220	22 3 33.4	1.48	10 2.2	13	5 49 45.64	9.038	22 14 7.1	1.80	22 22.6
18	5 37 27.03	5.888	22 3 28.0	1.20	9 46.1	17	5 50 21.38	8.827	22 14 13.7	1.49	22 7.5
22	5 37 4.21	−5.516	+22 3 23.8	−0.90	9 30.0	21	5 50 56.22	+8.587	+22 14 19.0	+1.16	21 52.3
26	5 36 42.95	5.108	22 3 20.8	0.56	9 13.9	25	5 51 30.03	8.313	22 14 23.0	0.86	21 37.1
30	5 36 23.39	4.667	22 3 19.3	−0.21	8 57.8	29	5 52 2.68	8.007	22 14 25.9	0.59	21 21.9
Feb. 3	5 36 5.65	4.197	22 3 19.2	+0.16	8 41.8	Aug. 2	5 52 34.05	7.673	22 14 27.6	0.30	21 6.7
7	5 35 49.85	3.698	22 3 20.6	0.53	8 25.8	6	5 53 4.03	7.313	22 14 28.2	+0.01	20 51.5
11	5 35 36.10	−3.171	+22 3 23.4	+0.90	8 9.9	10	5 53 32.52	+6.928	+22 14 27.7	−0.25	20 36.2
15	5 35 24.50	2.629	22 3 27.8	1.30	7 54.0	14	5 53 59.42	6.519	22 14 26.2	0.49	20 20.9
19	5 35 15.08	2.077	22 3 33.8	1.70	7 38.1	18	5 54 24.64	6.087	22 14 23.8	0.70	20 5.6
23	5 35 7.90	1.511	22 3 41.4	2.09	7 22.2	22	5 54 48.08	5.629	22 14 20.6	0.90	19 50.2
27	5 35 3.01	0.930	22 3 50.5	2.48	7 6.4	26	5 55 9.64	5.147	22 14 16.6	1.10	19 34.9
Mar. 3	5 35 0.48	−0.339	+22 4 1.2	+2.85	6 50.7	30	5 55 29.23	+4.645	+22 14 11.8	−1.27	19 19.5
7	5 35 0.31	+0.256	22 4 13.3	3.21	6 34.9	Sept. 3	5 55 46.78	4.129	22 14 6.4	1.41	19 4.1
11	5 35 2.52	0.847	22 4 26.9	3.59	6 19.2	7	5 56 2.23	3.596	22 14 0.5	1.55	18 48.6
15	5 35 7.08	1.433	22 4 42.0	3.94	6 3.6	11	5 56 15.53	3.051	22 13 54.0	1.68	18 33.1
19	5 35 13.98	2.015	22 4 58.4	4.25	5 48.0	15	5 56 26.62	2.493	22 13 47.1	1.79	18 17.5
23	5 35 23.19	+2.590	+22 5 16.0	+4.55	5 32.4	19	5 56 35.46	+1.926	+22 13 39.8	−1.86	18 1.9
27	5 35 34.69	3.157	22 5 34.8	4.82	5 16.9	23	5 56 42.01	1.346	22 13 32.2	1.92	17 46.3
31	5 35 48.43	3.712	22 5 54.6	5.07	5 1.4	27	5 56 46.22	0.761	22 13 24.4	1.97	17 30.6
Apr. 4	5 36 4.37	4.253	22 6 15.4	5.29	4 45.9	Oct. 1	5 56 48.10	+0.176	22 13 16.4	2.01	17 14.9
8	5 36 22.43	4.772	22 6 36.9	5.46	4 30.5	5	5 56 47.64	−0.405	22 13 8.3	2.03	16 59.2
12	5 36 42.52	+5.271	+22 6 59.1	+5.62	4 15.1	9	5 56 44.87	−0.981	+22 13 0.2	−2.04	16 43.4
16	5 37 4.57	5.749	22 7 21.9	5.76	3 59.7	13	5 56 39.80	1.551	22 12 52.0	2.05	16 27.6
20	5 37 28.48	6.205	22 7 45.2	5.86	3 44.4	17	5 56 32.47	2.116	22 12 43.8	2.05	16 11.7
24	5 37 54.18	6.642	22 8 8.8	5.91	3 29.1	21	5 56 22.89	2.668	22 12 35.6	2.04	15 55.8
28	5 38 21.58	7.052	22 8 32.5	5.94	3 13.8	25	5 56 11.15	3.203	22 12 27.5	2.01	15 39.9
May 2	5 38 50.56	+7.435	+22 8 56.3	+5.92	2 58.6	29	5 55 57.29	−3.721	+22 12 19.5	−1.98	15 23.9
6	5 39 21.02	7.789	22 9 19.9	5.87	2 43.4	Nov. 2	5 55 41.42	4.210	22 12 11.7	1.94	15 7.9
10	5 39 52.83	8.110	22 9 43.3	5.81	2 28.2	6	5 55 23.65	4.672	22 12 4.0	1.91	14 51.9
14	5 40 25.87	8.406	22 10 6.4	5.72	2 13.0	10	5 55 4.08	5.110	22 11 56.4	1.87	14 35.9
18	5 41 0.04	8.674	22 10 29.1	5.59	1 57.8	14	5 54 42.81	5.517	22 11 49.0	1.81	14 19.8
22	5 41 35.21	+8.909	+22 10 51.1	+5.41	1 42.6	18	5 54 19.99	−5.890	+22 11 41.9	−1.75	14 3.7
26	5 42 11.27	9.116	22 11 12.4	5.24	1 27.5	22	5 53 55.74	6.227	22 11 35.0	1.70	13 47.5
30	5 42 48.09	9.288	22 11 33.0	5.04	1 12.4	26	5 53 30.23	6.521	22 11 28.3	1.64	13 31.4
June 3	5 43 25.53	9.427	22 11 52.7	4.80	0 57.3	30	5 53 3.63	6.772	22 11 21.9	1.56	13 15.2
7	5 44 3.46	9.533	22 12 11.4	4.55	0 42.2	Dec. 4	5 52 36.11	6.980	22 11 15.8	1.50	12 59.0
11	5 44 41.75	+9.606	+22 12 29.1	+4.29	0 27.1	8	5 52 7.85	−7.142	+22 11 9.9	−1.42	12 42.8
15	5 45 20.27	9.648	22 12 45.7	4.00	0 12.1	12	5 51 39.03	7.261	22 11 4.4	1.34	12 26.6
19	5 45 58.89	9.660	22 13 1.1	3.70	23 53.2	16	5 51 9.82	7.335	22 10 59.2	1.24	12 10.4
23	5 46 37.51	9.642	22 13 15.3	3.39	23 38.1	20	5 50 40.42	7.357	22 10 54.5	1.13	11 54.2
27	5 47 15.98	9.587	22 13 28.2	3.06	23 23.0	24	5 50 11.03	7.332	22 10 50.2	1.01	11 38.0
July 1	5 47 54.16	+9.495	+22 13 39.8	+2.75	23 7.9	28	5 49 41.83	−7.257	+22 10 46.4	−0.87	11 21.8
5	5 48 31.91	+9.374	+22 13 50.2	+2.44	22 52.8	32	5 49 13.05		+22 10 43.1		11 5.6

Greatest semidiameter,	December 19,	1″.33	Greatest horizontal parallax,	December 19,	0″.31
Least semidiameter,	June 18,	1″.25	Least horizontal parallax,	June 18,	0″.29

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 0	199 40 57.8	3 24 51.9	−10 33.4	+3 14 32.3	−22 15.4	9.6215332	0.0544512	0.0577509
1	203 3 26.6	3 20 9.5	9 36.9	2 52 12.5	22 23.4	9.6264262	0.0609681	0.0641048
2	206 21 24.0	3 15 48.9	8 33.9	2 29 47.1	22 26.7	9.6310574	0.0671626	0.0701431
3	209 35 11.4	3 11 49.0	7 25.6	2 7 20.5	22 26.0	9.6354232	0.0730480	0.0758788
4	212 45 8.7	3 8 8.9	6 13.1	1 44 56.3	22 21.9	9.6395219	0.0786373	0.0813249
5	215 51 35.4	3 4 47.6	− 4 57.4	+1 22 37.7	−22 14.8	9.6433523	0.0839432	0.0864936
6	218 54 49.8	3 1 44.3	3 39.6	1 0 27.5	22 5.2	9.6469140	0.0889776	0.0913966
7	221 55 9.6	2 58 58.2	2 20.6	0 38 28.1	21 53.4	9.6502068	0.0937518	0.0960447
8	224 52 51.6	2 56 28.6	− 1 1.2	+0 16 41.4	21 39.6	9.6532313	0.0982766	0.1004489
9	227 48 12.0	2 54 14.7	+ 0 17.8	−0 4 50.6	21 24.1	9.6559881	0.1025627	0.1046190
10	230 41 26.2	2 52 16.1	+ 1 35.6	−0 26 6.3	−21 7.1	9.6584782	0.1066188	0.1085634
11	233 32 49.2	2 50 32.2	2 51.7	0 47 4.4	20 48.8	9.6607022	0.1104537	0.1122909
12	236 22 35.2	2 49 2.2	4 5.4	1 7 43.5	20 29.2	9.6626617	0.1140759	0.1158094
13	239 10 58.2	2 47 46.0	5 16.1	1 28 2.4	20 8.5	9.6643573	0.1174925	0.1191261
14	241 58 11.8	2 46 43.2	6 23.2	1 48 0.1	19 46.7	9.6657897	0.1207108	0.1222473
15	244 44 29.0	2 45 53.3	+ 7 26.4	−2 7 35.4	−19 23.8	9.6669602	0.1237366	0.1251792
16	247 30 2.6	2 45 16.2	8 25.1	2 26 47.3	18 59.9	9.6678693	0.1265758	0.1279272
17	250 15 5.4	2 44 51.5	9 18.9	2 45 34.8	18 35.0	9.6685177	0.1292337	0.1304959
18	252 59 49.8	2 44 39.2	10 7.4	3 3 56.9	18 8.9	9.6689057	0.1317144	0.1328897
19	255 44 27.9	2 44 39.2	10 50.4	3 21 52.4	17 41.8	9.6690337	0.1340223	0.1351125
20	258 29 12.1	2 44 51.3	+11 27.3	−3 39 20.2	−17 13.5	9.6689019	0.1361607	0.1371674
21	261 14 14.6	2 45 15.7	11 57.9	3 56 19.0	16 43.9	9.6685098	0.1381327	0.1390570
22	263 59 47.6	2 45 52.3	12 22.0	4 12 47.5	16 13.0	9.6678574	0.1399406	0.1407836
23	266 46 3.4	2 46 41.3	12 39.2	4 28 44.4	15 40.5	9.6669442	0.1415862	0.1423488
24	269 33 14.4	2 47 42.8	12 49.4	4 44 8.0	15 6.4	9.6657697	0.1430714	0.1437539
25	272 21 33.3	2 48 57.0	+12 52.2	−4 58 56.7	−14 30.6	9.6643331	0.1443965	0.1449992
26	275 11 12.9	2 50 24.2	12 47.6	5 13 8.6	13 52.8	9.6626335	0.1455621	0.1460852
27	278 2 26.2	2 52 4.7	12 35.4	5 26 41.5	13 12.7	9.6606702	0.1465683	0.1470113
28	280 55 26.8	2 53 58.8	12 15.4	5 39 33.2	12 30.3	9.6584420	0.1474140	0.1477762
29	283 50 28.4	2 56 6.9	11 47.7	5 51 41.3	11 45.3	9.6559478	0.1480977	0.1483785
30	286 47 45.4	2 58 29.5	+11 12.2	−6 3 2.8	−10 57.3	9.6531869	0.1486182	0.1488163
31	289 47 32.3	3 1 7.0	10 29.0	6 13 34.9	10 6.1	9.6501584	0.1489723	0.1490861
Feb. 1	292 50 4.6	3 4 0.2	9 38.1	6 23 13.9	9 11.4	9.6468613	0.1491571	0.1491849
2	295 55 38.0	3 7 9.4	8 39.7	6 31 56.4	8 12.8	9.6432955	0.1491690	0.1491092
3	299 4 28.9	3 10 35.3	7 34.1	6 39 38.1	7 9.9	9.6394609	0.1490041	0.1488525
4	302 16 54.4	3 14 18.7	+ 6 21.7	−6 46 14.6	− 6 2.3	9.6353581	0.1486543	0.1484094
5	305 33 12.4	3 18 20.2	5 3.0	6 51 41.0	4 49.6	9.6309881	0.1481165	0.1477745
6	308 53 41.1	3 22 40.5	3 38.6	6 55 51.9	3 31.3	9.6263530	0.1473825	0.1469396
7	312 18 40.0	3 27 20.4	2 9.3	6 58 41.5	2 6.9	9.6214558	0.1464445	0.1458961
8	315 48 28.7	3 32 20.5	+ 0 36.0	7 0 3.6	− 0 36.0	9.6163009	0.1452933	0.1446348
9	319 23 27.9	3 37 41.5	− 1 0.2	−6 59 51.2	+ 1 1.9	9.6108943	0.1439191	0.1431447
10	323 3 58.8	3 43 24.0	2 37.8	6 57 57.3	2 47.3	9.6052441	0.1423100	0.1414138
11	326 50 23.2	3 49 28.5	4 15.4	6 54 14.0	4 40.6	9.5993605	0.1404541	0.1394293
12	330 43 3.3	3 55 55.4	5 51.1	6 48 33.3	6 42.3	9.5932564	0.1383375	0.1371767
13	334 42 21.6	4 2 44.9	7 22.9	6 40 46.7	8 52.4	9.5869483	0.1359448	0.1346399
14	338 48 40.5	4 9 56.8	− 8 48.4	−6 30 45.5	+11 11.3	9.5804561	0.1332596	0.1318019
15	343 2 22.5	4 17 30.8	−10 5.3	−6 18 21.2	+13 38.8	9.5738042	0.1302641	0.1286440

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Feb. 15	343 2 22.5	4 17 30.8	−10 5.3	−6 18 21.2	+13 38.8	9.5738042	0.1302641	0.1286440
16	347 23 49.1	4 25 26.0	11 10.9	6 3 25.2	16 14.5	9.5670224	0.1269388	0.1251460
17	351 53 21.0	4 33 41.0	12 2.3	5 45 49.6	18 57.9	9.5601455	0.1232627	0.1212865
18	356 31 17.0	4 42 13.9	12 36.8	5 25 27.3	21 47.8	9.5532147	0.1192143	0.1170431
19	1 17 53.7	4 51 1.9	12 51.8	5 2 12.5	24 42.6	9.5462782	0.1147699	0.1123919
20	6 13 24.6	5 0 1.5	−12 44.8	−4 36 1.3	+27 40.0	9.5393907	0.1099058	0.1073088
21	11 17 59.0	5 9 8.1	12 14.0	4 6 52.5	30 37.0	9.5326150	0.1045976	0.1017690
22	16 31 41.2	5 18 16.0	11 18.2	3 34 48.0	33 30.8	9.5260205	0.0988201	0.0957481
23	21 54 29.2	5 27 18.6	9 57.1	2 59 53.8	36 16.0	9.5196836	0.0925499	0.0892226
24	27 26 13.8	5 36 7.8	8 11.8	2 22 20.4	38 48.2	9.5136861	0.0857634	0.0821698
25	33 6 37.4	5 44 34.9	− 6 4.6	−1 42 23.7	+41 1.6	9.5081140	0.0784394	0.0745702
26	38 55 12.9	5 52 30.0	3 39.5	1 0 25.4	42 50.4	9.5030555	0.0705602	0.0664079
27	44 51 23.2	5 59 42.5	− 1 1.9	−0 16 53.0	44 8.9	9.4985973	0.0621120	0.0576716
28	50 54 20.3	6 6 1.9	+ 1 41.4	+0 27 40.5	44 51.7	9.4948218	0.0530859	0.0483550
Mar. 1	57 3 5.9	6 11 17.8	4 22.6	1 12 37.1	44 54.4	9.4918038	0.0434794	0.0384600
2	63 16 31.6	6 15 20.6	+ 6 53.4	+1 57 15.2	+44 14.3	9.4896061	0.0332981	0.0279957
3	69 33 20.0	6 18 2.2	9 5.7	2 40 51.1	42 50.1	9.4882762	0.0225554	0.0169803
4	75 52 6.9	6 19 16.7	10 52.2	3 22 41.2	40 42.9	9.4878438	0.0112743	0.0054416
5	82 11 23.3	6 19 0.8	12 7.0	4 2 3.6	37 55.6	9.4883184	9.9994873	9.9934168
6	88 29 38.1	6 17 13.8	12 46.3	4 38 20.9	34 33.5	9.4896896	9.9872367	9.9809546
7	94 45 21.4	6 13 58.4	+12 48.8	+5 11 1.3	+30 43.1	9.4919267	9.9745774	9.9681132
8	100 57 7.3	6 9 20.1	12 15.2	5 39 40.1	26 31.9	9.4949813	9.9615703	9.9549584
9	107 3 36.5	6 3 26.5	11 8.7	6 4 0.7	22 7.9	9.4987901	9.9482873	9.9415680
10	113 3 38.4	5 56 27.3	9 34.0	6 23 54.2	17 38.9	9.5032780	9.9348113	9.9280295
11	118 56 13.1	5 48 33.9	7 37.1	6 39 19.2	13 12.1	9.5083625	9.9212334	9.9144349
12	124 40 31.9	5 39 57.6	+ 5 24.6	+6 50 21.1	+ 8 53.5	9.5139562	9.9076470	9.9008835
13	130 15 57.7	5 30 49.8	3 3.1	6 57 10.5	4 47.9	9.5199714	9.8941577	9.8874836
14	135 42 4.7	5 21 21.6	+ 0 38.8	7 0 2.3	+ 0 59.0	9.5263221	9.8808751	9.8743466
15	140 58 37.4	5 11 42.9	− 1 42.5	6 59 14.6	− 2 31.0	9.5329267	9.8679126	9.8615879
16	146 5 29.9	5 2 2.5	3 56.3	6 55 6.9	5 41.0	9.5397090	9.8553871	9.8493248
17	151 2 44.2	4 52 27.7	− 5 58.9	+6 47 59.4	− 8 30.4	9.5465999	9.8434153	9.8376735
18	155 50 29.0	4 43 4.5	7 47.5	6 38 12.7	10 59.7	9.5535374	9.8321130	9.8267480
19	160 28 58.7	4 33 57.8	9 20.3	6 26 6.4	13 9.7	9.5604665	9.8215916	9.8166568
20	164 58 31.4	4 25 11.2	10 36.2	6 11 59.3	15 1.7	9.5673398	9.8119555	9.8074992
21	169 19 28.6	4 16 47.2	11 35.0	5 56 8.6	16 37.0	9.5741166	9.8032978	9.7993616
22	173 32 13.9	4 8 47.6	−12 16.8	+5 38 50.2	−17 57.3	9.5807614	9.7956988	9.7923168
23	177 37 12.2	4 1 13.4	12 42.2	5 20 18.5	19 3.9	9.5872457	9.7892217	9.7864186
24	181 34 49.4	3 54 5.2	12 52.0	5 0 46.4	19 58.5	9.5935450	9.7839111	9.7817016
25	185 25 31.2	3 47 22.8	12 47.5	4 40 25.0	20 42.5	9.5996392	9.7797913	9.7781800
26	189 9 43.5	3 41 6.0	12 29.9	4 19 24.6	21 17.0	9.6055121	9.7768662	9.7758469
27	192 47 51.5	3 35 14.2	−12 0.5	+3 57 53.7	−21 43.4	9.6111513	9.7751184	9.7746758
28	196 20 19.9	3 29 46.7	11 20.6	3 36 0.1	22 2.6	9.6165463	9.7745119	9.7746211
29	199 47 32.6	3 24 42.6	10 31.7	3 13 50.5	22 15.8	9.6216892	9.7749952	9.7756254
30	203 9 52.7	3 20 1.1	9 35.0	2 51 30.4	22 23.5	9.6265743	9.7765025	9.7776167
31	206 27 42.0	3 15 41.2	8 31.9	2 29 5.0	22 26.7	9.6311972	9.7789580	9.7805157
Apr. 1	209 41 21.9	3 11 41.9	− 7 23.4	+2 6 38.4	−22 25.9	9.6355548	9.7822792	9.7842377
2	212 51 12.3	3 8 2.2	− 6 10.8	+1 44 14.3	−22 21.7	9.6396453	9.7863802	9.7886959

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr. 1	209 41 21.9	3 11 41.9	− 7 23.4	+2 6 38.4	−22 25.9	9.6355548	9.7822792	9.7842377
2	212 51 12.3	3 8 2.2	6 10.8	1 44 14.3	22 21.7	9.6396453	9.7863802	9.7886959
3	215 57 32.7	3 4 41.5	4 55.0	1 21 55.9	22 14.6	9.6434674	9.7911742	9.7938044
4	219 0 41.4	3 1 38.8	3 37.2	0 59 46.0	22 4.9	9.6470207	9.7965761	9.7994793
5	222 0 56.0	2 58 53.2	2 18.2	0 37 46.9	21 53.0	9.6503052	9.8025042	9.8056413
6	224 58 33.4	2 56 24.1	− 0 58.7	+0 16 0.7	−21 39.1	9.6533214	9.8088816	9.8122163
7	227 53 49.6	2 54 10.8	+ 0 20.2	−0 5 30.8	21 23.6	9.6560700	9.8156371	9.8191363
8	230 47 0.1	2 52 12.7	1 38.1	0 26 46.0	21 6.6	9.6585518	9.8227061	9.8263396
9	233 38 19.8	2 50 29.1	2 54.1	0 47 43.5	20 48.2	9.6607677	9.8300300	9.8337710
10	236 28 3.0	2 48 59.6	4 7.7	1 8 22.0	20 28.6	9.6627190	9.8375566	9.8413814
11	239 16 23.6	2 47 43.9	+ 5 18.2	−1 28 40.2	−20 7.8	9.6644063	9.8452401	9.8491280
12	242 3 35.2	2 46 41.4	6 25.3	1 48 37.2	19 46.0	9.6658306	9.8530404	9.8569734
13	244 49 50.8	2 45 51.9	7 28.3	2 8 11.9	19 23.1	9.6669930	9.8609227	9.8648850
14	247 35 23.3	2 45 15.2	8 26.8	2 27 23.0	18 59.1	9.6678940	9.8688569	9.8728353
15	250 20 25.3	2 44 50.9	9 20.5	2 46 9.8	18 34.2	9.6685343	9.8768173	9.8808004
16	253 5 9.2	2 44 39.0	+10 8.9	−3 4 31.0	−18 8.1	9.6689142	9.8847822	9.8887605
17	255 49 47.3	2 44 39.3	10 51.6	3 22 25.6	17 40.9	9.6690340	9.8927331	9.8966984
18	258 34 31.9	2 44 51.9	11 28.3	3 39 52.5	17 12.6	9.6688940	9.9006545	9.9046000
19	261 19 35.1	2 45 16.6	11 58.8	3 56 50.4	16 43.0	9.6684939	9.9085336	9.9124537
20	264 5 9.2	2 45 53.6	12 22.6	4 13 18.0	16 11.9	9.6678335	9.9163593	9.9202494
21	266 51 26.5	2 46 43.0	+12 39.6	−4 29 13.8	−15 39.5	9.6669123	9.9241230	9.9279792
22	269 38 39.4	2 47 44.9	12 49.5	4 44 36.4	15 5.4	9.6657295	9.9318173	9.9356364
23	272 27 0.6	2 48 59.5	12 52.2	4 59 23.9	14 29.4	9.6642846	9.9394359	9.9432153
24	275 16 42.8	2 50 27.1	12 47.3	5 13 34.6	13 51.5	9.6625768	9.9469742	9.9507119
25	278 7 59.2	2 52 8.0	12 34.9	5 27 6.2	13 11.4	9.6606052	9.9544281	9.9581223
26	281 1 3.3	2 54 2.5	+12 14.7	−5 39 56.7	−12 29.0	9.6583686	9.9617941	9.9654433
27	283 56 8.9	2 56 11.0	11 46.8	5 52 3.3	11 43.8	9.6558662	9.9690695	9.9726720
28	286 53 30.2	2 58 34.1	11 11.0	6 3 23.4	10 55.8	9.6530969	9.9762509	9.9798062
29	289 53 22.1	3 1 12.2	10 27.5	6 13 53.8	10 4.5	9.6500600	9.9833375	9.9868443
30	292 55 59.8	3 4 5.8	9 36.3	6 23 31.2	9 9.6	9.6467546	9.9903264	9.9937837
May 1	296 1 39.0	3 7 15.5	+ 8 37.7	−6 32 11.8	− 8 10.9	9.6431804	9.9972159	0.0006226
2	299 10 36.3	3 10 42.0	7 32.0	6 39 51.5	7 7.9	9.6393374	0.0040035	0.0073585
3	302 23 8.8	3 14 25.9	6 19.4	6 46 25.9	6 0.1	9.6352262	0.0106872	0.0139890
4	305 39 34.2	3 18 28.0	5 0.5	6 51 50.0	4 47.2	9.6308480	0.0172638	0.0205109
5	309 0 11.1	3 22 48.9	3 35.9	6 55 58.4	3 28.7	9.6262045	0.0237299	0.0269205
6	312 25 18.6	3 27 29.4	+ 2 6.4	−6 58 45.4	− 2 4.2	9.6212993	0.0300821	0.0332142
7	315 55 16.7	3 32 30.1	+ 0 33.0	7 0 4.6	− 0 33.1	9.6161366	0.0363160	0.0393868
8	319 30 25.8	3 37 51.8	− 1 3.2	6 59 49.3	+ 1 5.0	9.6107222	0.0424259	0.0454327
9	323 11 7.4	3 43 35.0	2 40.9	6 57 52.0	2 50.7	9.6050640	0.0484062	0.0513457
10	326 57 43.1	3 49 40.2	4 18.4	6 54 5.2	4 44.3	9.5991736	0.0542500	0.0571182
11	330 50 35.3	3 56 7.8	− 5 54.0	−6 48 20.7	+ 6 46.2	9.5930628	0.0599492	0.0627417
12	334 50 6.3	4 2 58.0	7 25.6	6 40 30.0	8 56.6	9.5867487	0.0654945	0.0682065
13	338 56 38.7	4 10 10.6	8 51.0	6 30 24.5	11 15.8	9.5802511	0.0708761	0.0735016
14	343 10 34.8	4 17 45.2	10 7.6	6 17 55.6	13 43.5	9.5735947	0.0760818	0.0786148
15	347 32 16.2	4 25 41.0	11 12.7	6 2 54.8	16 19.5	9.5668092	0.0810989	0.0835322
16	352 2 3.5	4 33 56.7	−12 3.7	−5 45 14.1	+19 3.1	9.5599298	0.0859128	0.0882387
17	356 40 15.5	4 42 30.1	−12 37.6	−5 24 46.4	+21 53.2	9.5529981	0.0905076	0.0927174

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
May 16	352 2 3.5	4 33 56.7	−12 3.7	−5 45 14.1	+19 3.1	9.5599298	0.0859128	0.0882387
17	356 40 15.5	4 42 30.1	12 37.6	5 24 46.4	21 53.2	9.5529981	0.0905076	0.0927174
18	1 27 8.7	4 51 18.5	12 51.9	5 1 26.2	24 48.1	9.5460622	0.0948657	0.0969502
19	6 22 56.4	5 0 18.4	12 44.3	4 35 9.5	27 45.6	9.5391774	0.0989683	0.1009175
20	11 27 47.8	5 9 25.1	12 12.7	4 5 55.2	30 42.8	9.5324062	0.1027950	0.1045981
21	16 41 47.0	5 18 33.0	−11 16.0	−3 33 45.3	+33 36.0	9.5258186	0.1063241	0.1079703
22	22 4 52.0	5 27 35.3	9 54.2	2 58 45.9	36 21.0	9.5194908	0.1095338	0.1110115
23	27 36 53.1	5 36 24.1	8 8.2	2 21 7.7	38 52.6	9.5135053	0.1124006	0.1136983
24	33 17 32.5	5 44 50.3	6 0.4	1 41 6.9	41 5.4	9.5079481	0.1149018	0.1160081
25	39 6 22.9	5 52 44.2	3 34.8	0 59 5.2	42 53.4	9.5029069	0.1170147	0.1179188
26	45 2 46.7	5 59 55.2	− 0 56.9	−0 15 30.4	+44 10.8	9.4984687	0.1187179	0.1194095
27	51 5 55.6	6 6 12.8	+ 1 46.5	+0 29 4.4	44 52.4	9.4947158	0.1199915	0.1204619
28	57 14 51.0	6 11 26.5	4 27.5	1 14 1.1	44 53.9	9.4917225	0.1208188	0.1210606
29	63 28 24.2	6 15 26.9	6 57.9	1 58 37.9	44 12.4	9.4895510	0.1211857	0.1211931
30	69 45 17.7	6 18 5.6	9 9.5	2 42 11.2	42 46.8	9.4882488	0.1210818	0.1208516
31	76 4 6.4	6 19 17.2	+10 55.0	+3 23 57.2	+40 38.2	9.4878445	0.1205019	0.1200327
June 1	82 23 22.3	6 18 59.0	12 8.8	4 3 14.4	37 49.9	9.4883473	0.1194443	0.1187376
2	88 41 34.2	6 17 9.3	12 47.0	4 39 25.5	34 26.8	9.4897457	0.1179132	0.1169720
3	94 57 11.5	6 13 51.0	12 48.3	5 11 58.6	30 35.5	9.4920090	0.1159158	0.1147467
4	101 8 48.8	6 9 10.1	12 13.6	5 40 29.7	26 23.8	9.4950883	0.1134661	0.1120760
5	107 15 6.9	6 3 14.4	+11 6.2	+6 4 42.0	+21 59.5	9.4989196	0.1105785	0.1089764
6	113 14 55.9	5 56 13.4	9 30.7	6 24 27.1	17 30.5	9.5034276	0.1072720	0.1054683
7	119 7 15.8	5 48 18.4	7 33.2	6 39 43.8	13 3.9	9.5085290	0.1035680	0.1015742
8	124 51 18.4	5 39 40.9	5 20.3	6 50 37.6	8 45.6	9.5141371	0.0994893	0.0973168
9	130 26 27.2	5 30 32.4	2 58.6	6 57 19.4	4 40.5	9.5201642	0.0950595	0.0927201
10	135 52 16.4	5 21 5.7	+ 0 34.4	+7 0 4.2	+ 0 52.1	9.5265240	0.0903019	0.0878080
11	141 8 31.2	5 11 24.8	− 1 46.8	6 59 9.9	− 2 37.4	9.5331352	0.0852409	0.0826036
12	146 15 5.6	5 1 44.5	4 0.3	6 54 56.2	5 46.6	9.5399220	0.0798984	0.0771286
13	151 12 2.0	4 52 10.0	6 2.5	6 47 43.4	8 35.4	9.5468152	0.0742966	0.0714049
14	155 59 29.4	4 42 47.3	7 50.6	6 37 52.1	11 4.0	9.5537533	0.0684558	0.0654522
15	160 37 42.0	4 33 41.1	− 9 22.9	+6 25 41.7	−13 13.5	9.5606815	0.0623960	0.0592892
16	165 6 58.2	4 24 55.1	10 38.3	6 11 31.1	15 4.9	9.5675526	0.0561339	0.0529324
17	169 27 39.8	4 16 31.9	11 36.6	5 55 37.4	16 39.8	9.5743255	0.0496865	0.0463982
18	173 40 10.2	4 8 33.1	12 17.8	5 38 16.6	17 59.6	9.5809659	0.0430667	0.0396967
19	177 44 54.4	4 0 59.7	12 42.7	5 19 42.8	19 5.8	9.5874447	0.0362889	0.0328455
20	181 42 18.2	3 53 52.3	−12 52.1	+5 0 8.9	−20 0.1	9.5937378	0.0293672	0.0258548
21	185 32 47.5	3 47 10.7	12 47.2	4 39 46.2	20 43.7	9.5998250	0.0223097	0.0187335
22	189 16 48.0	3 40 54.6	12 29.2	4 18 44.6	21 18.0	9.6056906	0.0151272	0.0114919
23	192 54 45.1	3 35 3.6	11 59.4	3 57 13.0	21 44.1	9.6113225	0.0078287	0.0041386
24	196 27 3.3	3 29 36.9	11 19.2	3 35 18.8	22 3.2	9.6167100	0.0004223	9.9966807
25	199 54 6.6	3 24 33.5	−10 30.1	+3 13 8.7	−22 16.1	9.6218450	9.9929148	9.9891255
26	203 16 17.9	3 19 52.7	9 33.2	2 50 48.4	22 23.7	9.6267220	9.9853136	9.9814800
27	206 33 59.2	3 15 33.4	8 29.8	2 28 22.9	22 26.7	9.6313368	9.9776253	9.9737503
28	209 47 31.6	3 11 34.7	7 21.2	2 5 56.3	22 25.8	9.6356861	9.9698559	9.9659427
29	212 57 15.2	3 7 55.7	6 8.4	1 43 32.4	22 21.5	9.6397681	9.9620116	9.9580632
30	216 3 29.4	3 4 35.6	− 4 52.6	+1 21 14.2	−22 14.3	9.6435817	9.9540985	9.9501184
July 1	219 6 32.4	3 1 33.4	− 3 34.7	+0 59 4.6	−22 4.5	9.6471268	9.9461235	9.9421146

MERCURY.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
								At Date.	At Intermediate Date.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July	1	219 6 32.4	3 1 33.4	− 3 34.7	+0 59 4.6	−22 4.5	9.6471268	9.9461235	9.9421146
	2	222 6 41.8	2 58 48.4	2 15.7	0 37 5.9	21 52.6	9.6504030	9.9380927	9.9340587
	3	225 4 14.6	2 56 19.8	− 0 56.3	+0 15 20.1	21 38.7	9.6534107	9.9300135	9.9259581
	4	227 59 26.7	2 54 6.9	+ 0 22.7	−0 6 10.9	21 23.1	9.6561509	9.9218938	9.9178216
	5	230 52 33.5	2 52 9.2	1 40.5	0 27 25.6	21 6.0	9.6586243	9.9137429	9.9096587
	6	233 43 50.0	2 50 26.1	+ 2 56.4	−0 48 22.5	−20 47.6	9.6608319	9.9055704	9.9014794
	7	236 33 30.5	2 48 57.1	4 9.9	1 9 0.4	20 27.9	9.6627747	9.8973874	9.8932960
	8	239 21 48.8	2 47 41.8	5 20.4	1 29 18.0	20 7.2	9.6644539	9.8892070	9.8851221
	9	242 8 58.4	2 46 39.7	6 27.3	1 49 14.3	19 45.3	9.6658701	9.8810435	9.8769734
	10	244 55 12.5	2 45 50.6	7 30.2	2 8 48.2	19 22.3	9.6670243	9.8729142	9.8688683
	11	247 40 43.9	2 45 14.3	+ 8 28.6	−2 27 58.7	−18 58.4	9.6679173	9.8648381	9.8608266
	12	250 25 45.2	2 44 50.4	9 22.1	2 46 44.6	18 33.4	9.6685496	9.8568371	9.8528725
	13	253 10 28.8	2 44 38.8	10 10.3	3 5 5.0	18 7.3	9.6689214	9.8489365	9.8450322
	14	255 55 7.0	2 44 39.6	10 52.8	3 22 58.8	17 40.1	9.6690332	9.8411640	9.8373355
	15	258 39 52.0	2 44 52.5	11 29.4	3 40 24.8	17 11.7	9.6688851	9.8335515	9.8298162
	16	261 24 56.0	2 45 17.7	+11 59.6	−3 57 21.8	−16 42.0	9.6684769	9.8261346	9.8225116
	17	264 10 31.4	2 45 55.0	12 23.3	4 13 48.4	16 11.0	9.6678082	9.8189528	9.8154636
	18	266 56 50.2	2 46 44.8	12 40.0	4 29 43.2	15 38.4	9.6668788	9.8120501	9.8087181
	19	269 44 5.2	2 47 47.1	12 49.7	4 45 4.7	15 4.3	9.6656879	9.8054745	9.8023256
	20	272 32 28.7	2 49 2.1	12 52.1	4 59 51.2	14 28.3	9.6642350	9.7992785	9.7963402
	21	275 22 13.7	2 50 30.1	+12 47.1	−5 14 0.6	−13 50.3	9.6625190	9.7935182	9.7908197
	22	278 13 33.3	2 52 11.4	12 34.4	5 27 31.0	13 10.2	9.6605392	9.7882527	9.7858249
	23	281 6 41.0	2 54 6.4	12 13.9	5 40 20.1	12 27.6	9.6582946	9.7835445	9.7814197
	24	284 1 50.6	2 56 15.3	11 45.8	5 52 25.4	11 42.4	9.6557840	9.7794585	9.7776689
	25	286 59 16.5	2 58 38.8	11 9.8	6 3 43.9	10 54.2	9.6530065	9.7760590	9.7746366
	26	289 59 13.3	3 1 17.4	+10 26.0	−6 14 12.7	−10 2.8	9.6499612	9.7734095	9.7723860
	27	293 1 56.4	3 4 11.4	9 34.6	6 23 48.4	9 7.9	9.6466476	9.7715727	9.7709764
	28	296 7 41.6	3 7 21.7	8 35.8	6 32 27.1	8 9.0	9.6430651	9.7706036	9.7704608
	29	299 16 45.4	3 10 48.7	7 29.8	6 40 4.9	7 5.8	9.6392139	9.7705527	9.7708847
	30	302 29 24.9	3 14 33.2	6 17.0	6 46 37.1	5 57.9	9.6350944	9.7714612	9.7722852
	31	305 45 57.9	3 18 35.8	+ 4 57.9	−6 51 59.0	− 4 44.8	9.6307082	9.7733599	9.7746872
Aug.	1	309 6 42.8	3 22 57.3	3 33.2	6 56 5.0	3 26.2	9.6260568	9.7762681	9.7781032
	2	312 31 59.1	3 27 38.5	2 3.5	6 58 49.3	2 1.4	9.6211437	9.7801917	9.7825324
	3	316 2 6.5	3 32 39.8	+ 0 30.0	7 0 5.6	− 0 30.1	9.6159731	9.7851231	9.7879616
	4	319 37 25.7	3 38 2.1	− 1 6.3	6 59 47.2	+ 1 8.2	9.6105514	9.7910420	9.7943611
	5	323 18 18.0	3 43 46.0	− 2 44.0	−6 57 46.6	+ 2 54.1	9.6048865	9.7979133	9.8016929
	6	327 5 5.0	3 49 51.9	4 21.5	6 53 56.3	4 48.0	9.5989890	9.8056915	9.8099036
	7	330 58 9.1	3 56 20.2	5 57.0	6 48 7.9	6 50.1	9.5928720	9.8143197	9.8189330
	8	334 57 52.8	4 3 11.0	7 28.4	6 40 13.2	9 0.9	9.5865521	9.8237331	9.8287119
	9	339 4 38.5	4 10 24.2	8 53.5	6 30 3.3	11 20.2	9.5800495	9.8338588	9.8391645
	10	343 18 48.6	4 17 59.5	−10 9.8	−6 17 29.8	+13 48.2	9.5733891	9.8446185	9.8502113
	11	347 40 44.6	4 25 55.9	11 14.5	6 2 24.1	16 24.5	9.5666006	9.8559320	9.8617701
	12	352 10 47.0	4 34 12.1	12 5.0	5 44 38.3	19 8.3	9.5597194	9.8677151	9.8737568
	13	356 49 14.7	4 42 46.0	12 38.4	5 24 5.4	21 58.5	9.5527873	9.8798845	9.8860877
	14	1 36 24.0	4 51 34.8	12 52.0	5 0 39.7	24 53.5	9.5458526	9.8923563	9.8986798
	15	6 32 28.1	5 0 35.0	−12 43.6	−4 34 17.6	+27 51.1	9.5389707	9.9050482	9.9114514
	16	11 37 36.1	5 9 41.8	−12 11.3	−4 4 57.8	+30 48.2	9.5322047	9.9178798	9.9243236

MERCURY.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
								At Date.	At Intermediate Date.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Aug.	16	11 37 36.1	5 9 41.8	−12 11.3	−4 4 57.8	+30 48.2	9.5322047	9.9178798	9.9243236
	17	16 51 51.9	5 18 49.5	11 13.9	3 32 42.5	33 41.3	9.5256243	9.9307735	9.9372199
	18	22 15 13.1	5 27 51.3	9 51.3	2 57 38.1	36 25.9	9.5193065	9.9436537	9.9500661
	19	27 47 30.0	5 36 39.5	8 4.5	2 19 55.3	38 57.0	9.5133332	9.9564482	9.9627916
	20	33 28 24.5	5 45 4.9	5 56.1	1 39 50.4	41 9.0	9.5077909	9.9690880	9.9753293
	21	39 17 28.9	5 52 57.6	− 3 30.0	−0 57 45.5	+42 56.2	9.5027674	9.9815079	9.9876162
	22	45 14 5.3	6 0 7.1	− 0 51.9	−0 14 8.3	44 12.5	9.4983495	9.9936471	9.9995936
	23	51 17 25.2	6 6 22.8	+ 1 51.5	+0 30 27.7	44 53.0	9.4946190	0.0054491	0.0112073
	24	57 26 29.6	6 11 34.4	4 32.4	1 15 24.3	44 53.1	9.4916504	0.0168623	0.0224088
	25	63 40 9.4	6 15 32.3	7 2.3	1 59 59.7	44 10.3	9.4895053	0.0278416	0.0331561
	26	69 57 7.1	6 18 8.7	+ 9 13.2	+2 43 30.3	+42 43.4	9.4882303	0.0383481	0.0434138
	27	76 15 57.8	6 19 17.6	10 57.8	3 25 12.3	40 33.5	9.4878537	0.0483498	0.0531527
	28	82 35 12.3	6 18 56.0	12 10.5	4 4 24.2	37 44.0	9.4883840	0.0578205	0.0623516
	29	88 53 19.7	6 17 3.6	12 47.6	4 40 28.9	34 20.0	9.4898095	0.0667443	0.0709973
	30	95 8 50.2	6 13 43.0	12 47.7	5 12 54.9	30 28.0	9.4920983	0.0751101	0.0790826
	31	101 20 18.2	6 8 59.7	+12 12.0	+5 41 18.1	+26 15.8	9.4952014	0.0829149	0.0866076
Sept.	1	107 26 24.9	6 3 1.8	11 3.6	6 5 22.4	21 51.3	9.4990540	0.0901616	0.0935782
	2	113 26 0.4	5 55 59.1	9 27.4	6 24 59.2	17 22.3	9.5035810	0.0968588	0.1000055
	3	119 18 5.3	5 48 2.7	7 29.3	6 40 7.7	12 55.8	9.5086988	0.1030200	0.1059050
	4	125 1 51.8	5 39 24.2	5 16.0	6 50 53.6	8 37.9	9.5143205	0.1086626	0.1112956
	5	130 36 43.4	5 30 14.9	+ 2 54.2	+6 57 27.9	+ 4 33.3	9.5203583	0.1138067	0.1161987
	6	136 2 15.0	5 20 45.9	+ 0 30.0	7 0 5.7	+ 0 45.4	9.5267264	0.1184746	0.1206372
	7	141 18 11.8	5 11 6.9	− 1 51.0	6 59 5.0	− 2 43.4	9.5333435	0.1226896	0.1246349
	8	146 24 28.3	5 1 26.6	4 4.2	6 54 45.5	5 52.1	9.5401341	0.1264760	0.1282157
	9	151 21 7.0	4 51 52.4	6 6.0	6 47 27.6	8 40.2	9.5470291	0.1298570	0.1314032
	10	156 8 17.1	4 42 30.2	− 7 53.7	+6 37 31.7	−11 8.3	9.5539672	0.1328568	0.1342206
	11	160 46 13.0	4 33 24.7	9 25.5	6 25 17.5	13 17.2	9.5608939	0.1354974	0.1366899
	12	165 15 13.3	4 24 39.4	10 40.4	6 11 3.4	15 8.0	9.5677621	0.1378007	0.1388322
	13	169 35 39.4	4 16 16.9	11 38.1	5 55 6.9	16 42.4	9.5745312	0.1397866	0.1406666
	14	173 47 55.2	4 8 18.9	12 18.8	5 37 43.6	18 1.8	9.5811666	0.1414741	0.1422114
	15	177 52 25.7	4 0 46.4	−12 43.2	+5 19 7.8	−19 7.7	9.5876395	0.1428804	0.1434834
	16	181 49 36.5	3 53 39.7	12 52.2	4 59 32.2	20 1.6	9.5939262	0.1440218	0.1444979
	17	185 39 53.7	3 46 58.9	12 46.8	4 39 8.2	20 44.9	9.6000070	0.1449130	0.1452688
	18	189 23 42.8	3 40 43.7	12 28.4	4 18 5.6	21 18.9	9.6058657	0.1455669	0.1458090
	19	193 1 29.3	3 34 53.4	11 58.3	3 56 33.2	21 44.8	9.6114900	0.1459963	0.1461296
	20	196 33 37.7	3 29 27.4	−11 17.9	+3 34 38.4	−22 3.6	9.6168694	0.1462104	0.1462403
	21	200 0 31.9	3 24 24.8	10 28.4	3 12 27.9	22 16.4	9.6219966	0.1462202	0.1461511
	22	203 22 34.8	3 19 44.6	9 31.3	2 50 7.4	22 23.8	9.6268654	0.1460338	0.1458694
	23	206 40 8.2	3 15 25.9	8 27.8	2 27 41.7	22 26.8	9.6314718	0.1456587	0.1454026
	24	209 53 33.5	3 11 27.9	7 19.0	2 5 15.1	22 25.8	9.6358128	0.1451017	0.1447566
	25	213 3 10.6	3 7 49.5	− 6 6.2	+1 42 51.3	−22 21.4	9.6398868	0.1443680	0.1439365
	26	216 9 18.8	3 4 29.9	4 50.3	1 20 33.4	22 14.1	9.6436924	0.1434626	0.1429467
	27	219 12 16.4	3 1 28.2	3 32.3	0 58 24.0	22 4.2	9.6472291	0.1423893	0.1417909
	28	222 12 21.0	2 58 43.7	2 13.2	0 36 25.6	21 52.2	9.6504969	0.1411518	0.1404722
	29	225 9 49.4	2 56 15.6	− 0 53.8	+0 14 40.3	21 38.2	9.6534966	0.1397524	0.1389925
	30	228 4 57.5	2 54 3.3	+ 0 25.1	−0 6 50.3	−21 22.6	9.6562287	0.1381928	0.1373535
Oct.	1	230 58 0.9	2 52 6.0	+ 1 42.8	−0 28 4.4	−21 5.5	9.6586939	0.1364747	0.1355563

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 1	230 58 0.9	2 52 6.0	+ 1 42.8	−0 28 4.4	−21 5.5	9.6586939	0.1364747	0.1355563
2	233 49 14.4	2 50 23.4	2 58.7	0 49 0.8	20 47.0	9.6608934	0.1345985	0.1336012
3	236 38 52.3	2 48 54.7	4 12.1	1 9 38.1	20 27.4	9.6628283	0.1325645	0.1314884
4	239 27 8.4	2 47 39.8	5 22.5	1 29 55.1	20 6.5	9.6644994	0.1303726	0.1292169
5	242 14 16.3	2 46 38.2	6 29.3	1 49 50.8	19 44.6	9.6659076	0.1280213	0.1267856
6	245 0 29.1	2 45 49.4	+ 7 32.1	−2 9 24.0	−19 21.6	9.6670539	0.1255095	0.1241929
7	247 45 59.5	2 45 13.4	8 30.3	2 28 33.7	18 57.6	9.6679388	0.1228354	0.1214367
8	250 31 0.1	2 44 49.9	9 23.7	2 47 18.9	18 32.6	9.6685631	0.1199963	0.1185139
9	253 15 43.5	2 44 38.8	10 11.7	3 5 38.5	18 6.5	9.6689271	0.1169891	0.1154215
10	256 0 21.8	2 44 39.9	10 54.1	3 23 31.5	17 39.2	9.6690310	0.1138106	0.1121557
11	258 45 7.3	2 44 53.2	+11 30.4	−3 40 56.6	−17 10.8	9.6688749	0.1104565	0.1087125
12	261 30 12.2	2 45 18.7	12 0.5	3 57 52.7	16 41.1	9.6684588	0.1069229	0.1050868
13	264 15 48.8	2 45 56.4	12 23.9	4 14 18.4	16 10.0	9.6677822	0.1032037	0.1012731
14	267 2 9.3	2 46 46.6	12 40.4	4 30 12.2	15 37.4	9.6668452	0.0992942	0.0972661
15	269 49 26.1	2 47 49.2	12 49.9	4 45 32.6	15 3.2	9.6656464	0.0951879	0.0930589
16	272 37 52.0	2 49 4.7	+12 52.1	−5 0 18.0	−14 27.2	9.6641856	0.0908782	0.0886452
17	275 27 39.8	2 50 33.0	12 46.8	5 14 26.2	13 49.1	9.6624617	0.0863586	0.0840175
18	278 19 2.5	2 52 14.7	12 33.8	5 27 55.4	13 8.9	9.6604740	0.0816209	0.0791678
19	281 12 13.8	2 54 10.1	12 13.2	5 40 43.2	12 26.2	9.6582213	0.0766573	0.0740884
20	284 7 27.4	2 56 19.5	11 44.8	5 52 47.0	11 40.9	9.6557027	0.0714597	0.0687700
21	287 4 57.7	2 58 43.5	+11 8.5	−6 4 4.1	−10 52.7	9.6529170	0.0660184	0.0632038
22	290 4 59.4	3 1 22.5	10 24.5	6 14 31.3	10 1.2	9.6498639	0.0603250	0.0573806
23	293 7 47.8	3 4 17.0	9 32.9	6 24 5.3	9 6.1	9.6465421	0.0543693	0.0512900
24	296 13 38.8	3 7 27.9	8 33.8	6 32 42.2	8 7.1	9.6429517	0.0481415	0.0449226
25	299 22 48.9	3 10 55.3	7 27.6	6 40 18.0	7 3.8	9.6390924	0.0416318	0.0382681
26	302 35 35.3	3 14 40.3	+ 6 14.6	−6 46 48.2	− 5 55.7	9.6349649	0.0348302	0.0313169
27	305 52 15.6	3 18 43.5	4 55.4	6 52 7.7	4 42.5	9.6305705	0.0277270	0.0240587
28	309 13 8.6	3 23 5.6	3 30.4	6 56 11.3	3 23.7	9.6259111	0.0203124	0.0164864
29	312 38 33.4	3 27 47.3	2 0.7	6 58 53.0	1 58.7	9.6209902	0.0125798	0.0085912
30	316 8 50.0	3 32 49.3	+ 0 27.1	7 0 6.6	− 0 27.2	9.6158122	0.0045203	0.0003665
31	319 44 19.0	3 38 12.2	− 1 9.3	−6 59 45.1	+ 1 11.4	9.6103830	9.9961296	9.9918092
Nov. 1	323 25 21.6	3 43 56.7	2 47.0	6 57 41.2	2 57.5	9.6047111	9.9874053	9.9829184
2	327 12 19.7	3 50 3.3	4 24.4	6 53 47.4	4 51.6	9.5988067	9.9783489	9.9736975
3	331 5 35.6	3 56 32.2	5 59.9	6 47 55.3	6 54.0	9.5926834	9.9689658	9.9641559
4	335 5 31.7	4 3 23.7	7 31.2	6 39 56.5	9 5.0	9.5863576	9.9592698	9.9543101
5	339 12 30.5	4 10 37.7	− 8 56.0	−6 29 42.4	+11 24.6	9.5798499	9.9492803	9.9441850
6	343 26 54.4	4 18 13.6	10 12.0	6 17 4.3	13 52.9	9.5731852	9.9390290	9.9338184
7	347 49 4.8	4 26 10.6	11 16.3	6 1 53.8	16 29.4	9.5663934	9.9285600	9.9232618
8	352 19 22.2	4 34 27.4	12 6.3	5 44 3.0	19 13.4	9.5595100	9.9179331	9.9125843
9	356 58 5.4	4 43 1.8	12 39.1	5 23 24.9	22 3.8	9.5525769	9.9072277	9.9018765
10	1 45 30.7	4 51 51.0	−12 52.1	−4 59 53.9	+24 58.9	9.5456429	9.8965461	9.8912529
11	6 41 51.2	5 0 51.4	12 43.0	4 33 26.3	27 56.5	9.5387636	9.8860160	9.8808557
12	11 47 15.7	5 9 58.4	12 9.9	4 4 1.1	30 53.6	9.5320020	9.8757943	9.8708561
13	17 1 48.1	5 19 6.0	11 11.7	3 31 40.6	33 46.4	9.5254285	9.8660665	9.8614537
14	22 25 25.7	5 28 7.6	9 48.3	2 56 31.1	36 30.7	9.5191198	9.8570463	9.8528751
15	27 57 58.6	5 36 55.2	− 8 0.9	−2 18 43.7	+39 1.4	9.5131583	9.8489704	9.8453644
16	33 39 8.4	5 45 19.8	− 5 51.8	−1 38 34.8	+41 12.7	9.5076304	9.8420878	9.8391724

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Nov. 16	33 39 8.4	5 45 19.8	− 5 51.8	−1 38 34.8	+41 12.7	9.5076304	9.8420878	9.8391724
17	39 28 27.1	5 53 11.3	3 25.3	0 56 26.6	42 59.0	9.5026238	9.8366466	9.8345393
18	45 25 16.5	6 0 19.4	− 0 46.9	−0 12 47.2	44 14.3	9.4982254	9.8328745	9.8316749
19	51 28 47.8	6 6 33.3	+ 1 56.5	+0 31 50.0	44 53.6	9.4945171	9.8309574	9.8307357
20	57 38 1.7	6 11 42.8	4 37.1	1 16 46.6	44 52.5	9.4915724	9.8310197	9.8318109
21	63 51 48.8	6 15 38.3	+ 7 6.6	+2 1 20.7	+44 8.3	9.4894531	9.8331077	9.8349027
22	70 8 51.2	6 18 12.1	9 16.8	2 44 48.6	42 40.0	9.4882048	9.8371834	9.8399318
23	76 27 44.0	6 19 18.4	11 0.5	3 26 26.6	40 28.9	9.4878557	9.8431266	9.8467413
24	82 46 57.9	6 18 54.1	12 12.2	4 5 33.4	37 38.3	9.4884134	9.8507479	9.8551141
25	89 5 2.0	6 16 58.9	12 48.1	4 41 31.8	34 13.2	9.4898656	9.8598077	9.8647940
26	95 20 26.5	6 13 35.6	+12 47.2	+5 13 50.7	+30 20.6	9.4921806	9.8700390	9.8755079
27	101 31 45.9	6 8 50.0	12 10.4	5 42 6.3	26 7.8	9.4953067	9.8811677	9.8869856
28	107 37 41.8	6 2 50.0	11 1.1	6 6 2.4	21 43.1	9.4991809	9.8929312	9.8989753
29	113 37 4.6	5 55 45.5	9 24.0	6 25 31.0	17 14.0	9.5037268	9.9050908	9.9112528
30	119 28 55.1	5 47 47.6	7 25.4	6 40 31.4	12 47.8	9.5088614	9.9174385	9.9236274
Dec. 1	125 12 25.9	5 39 8.0	+ 5 11.8	+6 51 9.4	+ 8 30.2	9.5144972	9.9298007	9.9359421
2	130 47 0.9	5 29 58.0	2 49.8	6 57 36.2	4 26.0	9.5205463	9.9420370	9.9480727
3	136 12 15.3	5 20 28.5	+ 0 25.6	7 0 7.0	+ 0 38.7	9.5269231	9.9540381	9.9599240
4	141 37 54.6	5 10 49.4	− 1 55.3	6 58 59.9	− 2 49.5	9.5335466	9.9657222	9.9714261
5	146 33 53.6	5 1 9.2	4 8.2	6 54 34.6	5 57.5	9.5403414	9.9770301	9.9825299
6	151 30 14.9	4 51 35.2	− 6 9.6	+6 47 11.6	− 8 45.1	9.5472387	9.9879220	9.9932037
7	156 17 8.0	4 42 13.4	7 56.8	6 37 11.2	11 12.5	9.5541774	9.9983731	0.0034290
8	160 54 47.3	4 33 8.5	9 28.0	6 24 52.9	13 20.8	9.5611029	0.0083706	0.0131979
9	165 23 31.6	4 24 23.9	10 42.4	6 10 35.5	15 11.2	9.5679687	0.0179110	0.0225104
10	169 43 42.6	4 16 2.1	11 39.6	5 54 36.0	16 45.1	9.5747342	0.0269969	0.0313719
11	173 55 44.0	4 8 4.8	−12 19.8	+5 37 10.3	−18 4.0	9.5813653	0.0356366	0.0397926
12	178 0 0.7	4 0 33.0	12 43.7	5 18 32.4	19 9.5	9.5878331	0.0438414	0.0477851
13	181 56 58.6	3 53 27.1	12 52.2	4 58 55.2	20 3.1	9.5941135	0.0516254	0.0553644
14	185 47 3.6	3 46 47.1	12 46.4	4 38 29.8	20 46.1	9.6001878	0.0590040	0.0625461
15	189 30 41.4	3 40 32.7	12 27.6	4 17 26.2	21 19.8	9.6060397	0.0659929	0.0693465
16	193 8 17.2	3 34 43.1	−11 57.2	+3 55 52.9	−21 45.5	9.6116568	0.0726089	0.0757822
17	196 40 15.7	3 29 17.8	11 16.5	3 33 57.5	22 4.1	9.6170290	0.0788682	0.0818691
18	200 7 0.6	3 24 15.9	10 26.8	3 11 46.6	22 16.7	9.6221485	0.0847867	0.0876230
19	203 28 55.0	3 19 36.4	9 29.4	2 49 25.9	22 24.0	9.6270097	0.0903798	0.0930589
20	206 46 20.6	3 15 18.4	8 25.7	2 27 0.1	22 26.8	9.6316081	0.0956621	0.0981913
21	209 59 38.6	3 11 21.0	− 7 16.8	+2 4 33.5	−22 25.7	9.6359405	0.1006480	0.1030339
22	213 9 9.0	3 7 43.1	6 3.9	1 42 9.8	22 21.2	9.6400067	0.1053505	0.1075996
23	216 15 11.1	3 4 24.1	4 47.9	1 19 52.1	22 13.8	9.6438041	0.1097825	0.1119005
24	219 18 3.2	3 1 23.0	3 29.9	0 57 43.1	22 3.9	9.6473327	0.1139551	0.1159479
25	222 18 2.8	2 58 38.9	2 10.8	0 35 45.1	21 51.8	9.6505925	0.1178799	0.1197525
26	225 15 26.5	2 56 11.3	− 0 51.4	+0 14 0.2	−21 37.8	9.6535842	0.1215668	0.1233239
27	228 10 30.6	2 53 59.4	+ 0 27.5	−0 7 29.9	21 22.1	9.6563082	0.1250250	0.1266711
28	231 3 30.4	2 52 2.6	1 45.2	0 28 43.6	21 4.9	9.6587655	0.1282633	0.1298024
29	233 54 40.7	2 50 20.4	3 1.0	0 49 39.4	20 46.4	9.6609569	0.1312895	0.1327256
30	236 44 15.8	2 48 52.2	4 14.4	1 10 16.0	20 26.7	9.6628839	0.1341113	0.1354474
31	239 32 29.6	2 47 37.6	+ 5 24.6	−1 30 32.4	−20 5.8	9.6645471	0.1367348	0.1379742
32	242 19 35.6	2 46 36.4	+ 6 31.3	−1 50 27.4	−19 43.9	9.6659474	0.1391663	

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 1	343 55 36.9	1 35 13.3	+0 11.7	−3 23 31.1	−0 10.9	9.86177163	0.1650388	0.1637304
3	347 6 6.2	1 35 15.9	−0 8.3	3 23 34.2	+0 7.8	9.86167594	0.1624075	0.1610699
5	350 16 40.5	1 35 18.5	0 28.3	3 22 59.9	0 26.5	9.86157299	0.1597176	0.1583505
7	353 27 20.2	1 35 21.2	0 47.9	3 21 48.3	0 45.2	9.86146306	0.1569686	0.1555717
9	356 38 5.2	1 35 23.9	1 6.9	3 19 59.4	1 3.7	9.86134651	0.1541598	0.1527327
11	359 48 55.7	1 35 26.6	−1 25.1	−3 17 33.6	+1 22.1	9.86122367	0.1512905	0.1498331
13	2 59 51.8	1 35 29.5	1 42.3	3 14 31.2	1 40.2	9.86109490	0.1483605	0.1468725
15	6 10 53.6	1 35 32.3	1 58.2	3 10 52.8	1 58.1	9.86096062	0.1453690	0.1438499
17	9 22 1.1	1 35 35.2	2 12.7	3 6 38.9	2 15.7	9.86082122	0.1423152	0.1407645
19	12 33 14.5	1 35 38.2	2 25.5	3 1 50.3	2 32.9	9.86067710	0.1391977	0.1376147
21	15 44 33.9	1 35 41.2	−2 36.6	−2 56 27.8	+2 49.6	9.86052872	0.1360153	0.1343992
23	18 55 59.2	1 35 44.2	2 45.7	2 50 32.3	3 5.8	9.86037652	0.1327663	0.1311164
25	22 7 30.6	1 35 47.3	2 52.8	2 44 4.9	3 21.5	9.86022101	0.1294491	0.1277643
27	25 19 8.2	1 35 50.4	2 57.7	2 37 6.6	3 36.6	9.86006259	0.1260616	0.1243407
29	28 30 52.1	1 35 53.5	3 0.4	2 29 38.8	3 51.1	9.85990182	0.1226012	0.1208429
31	31 42 42.3	1 35 56.7	−3 1.0	−2 21 42.8	+4 4.9	9.85973914	0.1190655	0.1172686
Feb. 2	34 54 38.9	1 35 59.9	2 59.2	2 13 19.9	4 17.9	9.85957511	0.1154520	0.1136155
4	38 6 42.0	1 36 3.2	2 55.2	2 4 31.7	4 30.2	9.85941021	0.1117588	0.1098817
6	41 18 51.7	1 36 6.5	2 49.0	1 55 19.8	4 41.6	9.85924494	0.1079841	0.1060659
8	44 31 8.0	1 36 9.8	2 40.7	1 45 45.9	4 52.2	9.85907983	0.1041269	0.1021668
10	47 43 31.1	1 36 13.2	−2 30.3	−1 35 51.6	+5 1.9	9.85891544	0.1001854	0.0981827
12	50 56 1.0	1 36 16.7	2 18.1	1 25 38.9	5 10.6	9.85875220	0.0961584	0.0941124
14	54 8 37.8	1 36 20.2	2 4.1	1 15 9.7	5 18.5	9.85859070	0.0920445	0.0899544
16	57 21 21.6	1 36 23.7	1 48.6	1 4 25.8	5 25.3	9.85843141	0.0878419	0.0857067
18	60 34 12.5	1 36 27.2	1 31.7	0 53 29.2	5 31.1	9.85827484	0.0835486	0.0813675
20	63 47 10.4	1 36 30.8	−1 13.6	−0 42 22.1	+5 35.8	9.85812150	0.0791628	0.0769340
22	67 0 15.6	1 36 34.4	0 54.6	0 31 6.6	5 39.6	9.85797191	0.0746811	0.0724038
24	70 13 27.9	1 36 37.9	0 34.9	0 19 44.6	5 42.2	9.85782651	0.0701017	0.0677742
26	73 26 47.4	1 36 41.6	−0 14.7	−0 8 18.5	5 43.8	9.85768577	0.0654208	0.0630411
28	76 40 14.1	1 36 45.2	+0 5.6	+0 3 9.6	5 44.2	9.85755017	0.0606347	0.0582013
Mar. 2	79 53 47.9	1 36 48.7	+0 25.9	+0 14 37.6	+5 43.6	9.85742011	0.0557403	0.0532510
4	83 7 28.9	1 36 52.3	0 45.9	0 26 3.1	5 41.8	9.85729603	0.0507333	0.0481867
6	86 21 17.0	1 36 55.8	1 5.4	0 37 24.1	5 39.0	9.85717833	0.0456109	0.0430057
8	89 35 12.0	1 36 59.2	1 24.0	0 48 38.3	5 35.1	9.85706744	0.0403707	0.0377056
10	92 49 13.8	1 37 2.6	1 41.5	0 59 43.6	5 30.0	9.85696365	0.0350101	0.0322839
12	96 3 22.3	1 37 5.9	+1 57.8	+1 10 37.7	+5 23.9	9.85686732	0.0295267	0.0267380
14	99 17 37.2	1 37 9.0	2 12.5	1 21 18.6	5 16.8	9.85677876	0.0239176	0.0210656
16	102 31 58.4	1 37 12.1	2 25.6	1 31 44.2	5 8.6	9.85669833	0.0181812	0.0152638
18	105 46 25.5	1 37 15.0	2 36.8	1 41 52.4	4 59.4	9.85662626	0.0123133	0.0093296
20	109 0 58.3	1 37 17.8	2 46.0	1 51 41.2	4 49.3	9.85656274	0.0063120	0.0032599
22	112 15 36.4	1 37 20.3	+2 53.1	+2 1 8.8	+4 38.1	9.85650801	0.0001731	9.9970512
24	115 30 19.4	1 37 22.7	2 58.0	2 10 13.2	4 26.1	9.85646224	9.9938936	9.9906996
26	118 45 6.9	1 37 24.8	3 0.6	2 18 52.6	4 13.2	9.85642560	9.9874687	9.9842001
28	121 59 58.4	1 37 26.7	3 0.8	2 27 5.4	3 59.5	9.85639818	9.9808934	9.9775480
30	125 14 53.5	1 37 28.3	2 58.8	2 34 50.0	3 44.9	9.85638008	9.9741632	9.9707380
Apr. 1	128 29 51.6	1 37 29.7	+2 54.4	+2 42 4.7	+3 29.7	9.85637139	9.9672719	9.9637642
3	131 44 52.1	1 37 30.8	+2 47.9	+2 48 48.2	+3 13.7	9.85637213	9.9602144	9.9566217

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr. 1	128 29 51.6	1 37 29.7	+2 54.4	+2 42 4.7	+3 29.7	9.85637139	9.9672719	9.9637642
3	131 44 52.1	1 37 30.8	2 47.9	2 48 48.2	3 13.7	9.85637213	9.9602144	9.9566217
5	134 59 54.6	1 37 31.6	2 39.1	2 54 59.2	2 57.1	9.85638227	9.9529859	9.9493068
7	138 14 58.2	1 37 32.0	2 28.3	3 0 36.4	2 40.0	9.85640177	9.9455834	9.9418152
9	141 30 2.5	1 37 32.2	2 15.6	3 5 38.8	2 22.3	9.85643057	9.9380017	9.9341426
11	144 45 6.7	1 37 32.0	+2 1.2	+3 10 5.3	+2 4.2	9.85646863	9.9302374	9.9262854
13	148 0 10.2	1 37 31.4	1 45.2	3 13 55.2	1 45.6	9.85651574	9.9222862	9.9182394
15	151 15 12.3	1 37 30.5	1 27.8	3 17 7.6	1 26.8	9.85657181	9.9141443	9.9100004
17	154 30 12.1	1 37 29.3	1 9.4	3 19 42.0	1 7.6	9.85663662	9.9058072	9.9015644
19	157 45 9.2	1 37 27.7	0 50.0	3 21 37.9	0 48.3	9.85670998	9.8972712	9.8929268
21	161 0 2.8	1 37 25.8	+0 30.0	+3 22 55.0	+0 28.8	9.85679162	9.8885306	9.8840820
23	164 14 52.1	1 37 23.5	+0 9.7	3 23 33.1	+0 9.3	9.85688126	9.8795802	9.8750245
25	167 29 36.5	1 37 20.9	−0 10.8	3 23 32.1	−0 10.3	9.85697866	9.8704140	9.8657479
27	170 44 15.3	1 37 17.9	0 31.1	3 22 52.0	0 29.8	9.85708347	9.8610252	9.8562451
29	173 58 47.9	1 37 14.6	0 51.0	3 21 33.0	0 49.2	9.85719532	9.8514067	9.8465088
May 1	177 13 13.7	1 37 11.1	−1 10.3	+3 19 35.5	−1 8.3	9.85731391	9.8415511	9.8365329
3	180 27 32.0	1 37 7.2	1 28.7	3 16 59.8	1 27.2	9.85743881	9.8314534	9.8263119
5	183 41 42.4	1 37 3.1	1 45.9	3 13 46.7	1 45.9	9.85756962	9.8211079	9.8158408
7	186 55 44.2	1 36 58.7	2 1.7	3 9 56.6	2 4.1	9.85770592	9.8105103	9.8051160
9	190 9 37.1	1 36 54.1	2 16.0	3 5 30.6	2 21.9	9.85784728	9.7996574	9.7941342
11	193 23 20.5	1 36 49.3	−2 28.6	+3 0 29.5	−2 39.2	9.85799322	9.7885461	9.7828929
13	196 36 54.1	1 36 44.3	2 39.2	2 54 54.2	2 55.9	9.85814327	9.7771746	9.7713910
15	199 50 17.6	1 36 39.2	2 47.9	2 48 46.1	3 12.1	9.85829697	9.7655422	9.7596283
17	203 3 30.7	1 36 33.9	2 54.4	2 42 6.3	3 27.6	9.85845384	9.7536496	9.7476061
19	206 16 33.2	1 36 28.5	2 58.8	2 34 56.1	3 42.4	9.85861337	9.7414982	9.7353261
21	209 29 24.8	1 36 23.1	−3 0.8	+2 27 17.0	−3 56.5	9.85877505	9.7290903	9.7227911
23	212 42 5.5	1 36 17.6	3 0.6	2 19 10.5	4 9.8	9.85893838	9.7164294	9.7100057
25	215 54 35.2	1 36 12.1	2 58.2	2 10 38.3	4 22.3	9.85910281	9.7035211	9.6969762
27	219 6 54.0	1 36 6.6	2 53.5	2 1 41.9	4 33.9	9.85926788	9.6903726	9.6837123
29	222 19 1.9	1 36 1.2	2 46.6	1 52 23.1	4 44.7	9.85943306	9.6769969	9.6702285
31	225 30 58.8	1 35 55.8	−2 37.7	+1 42 43.7	−4 54.5	9.85959781	9.6634099	9.6565445
June 2	228 42 45.1	1 35 50.5	2 26.8	1 32 45.6	5 3.4	9.85976164	9.6496359	9.6426883
4	231 54 21.0	1 35 45.4	2 14.1	1 22 30.7	5 11.4	9.85992405	9.6357067	9.6286964
6	235 5 46.6	1 35 40.3	1 59.7	1 12 0.8	5 18.3	9.86008451	9.6216634	9.6146145
8	238 17 2.4	1 35 35.5	1 43.9	1 1 18.1	5 24.3	9.86024256	9.6075572	9.6004998
10	241 28 8.6	1 35 30.8	−1 26.8	+0 50 24.4	−5 29.2	9.86039768	9.5934514	9.5864221
12	244 39 5.6	1 35 26.3	1 8.6	0 39 21.9	5 33.1	9.86054945	9.5794227	9.5724650
14	247 49 53.9	1 35 22.0	0 49.6	0 28 12.6	5 36.0	9.86069738	9.5655618	9.5587269
16	251 0 33.9	1 35 18.0	0 30.0	0 16 58.5	5 37.9	9.86084104	9.5519754	9.5453224
18	254 11 6.1	1 35 14.2	−0 10.1	+0 5 41.7	5 38.7	9.86097995	9.5387843	9.5323787
20	257 21 31.0	1 35 10.7	+0 10.0	−0 5 35.7	−5 38.5	9.86111374	9.5261238	9.5200386
22	260 31 49.2	1 35 7.5	0 29.9	0 16 51.7	5 37.3	9.86124200	9.5141431	9.5084575
24	263 42 1.1	1 35 4.5	0 49.4	0 28 4.2	5 35.0	9.86136435	9.5030031	9.4978015
26	266 52 7.4	1 35 1.8	1 8.4	0 39 11.2	5 31.8	9.86148040	9.4928745	9.4882440
28	270 2 8.5	1 34 59.4	+1 26.4	0 50 10.6	5 27.5	9.86158983	9.4839317	9.4799590
30	273 12 5.2	1 34 57.3	+1 43.5	−1 1 0.5	−5 22.3	9.86169230	9.4763467	9.4731148
July 2	276 21 58.0	1 34 55.5	+1 59.2	−1 11 39.0	−5 16.0	9.86178751	9.4702812	9.4678620

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 2	276 21 58.0	1 34 55.5	+1 59.2	−1 11 39.0	−5 16.0	9.86178751	9.4702812	9.4678620
4	279 31 47.4	1 34 54.0	2 13.5	1 22 4.1	5 8.9	9.86187515	9.4658720	9.4643236
6	282 41 34.0	1 34 52.7	2 26.2	1 32 14.0	5 0.8	9.86195500	9.4632263	9.4625868
8	285 51 18.4	1 34 51.8	2 37.0	1 42 6.8	4 51.8	9.86202680	9.4624092	9.4626949
10	289 1 1.2	1 34 51.1	2 46.0	1 51 40.7	4 42.0	9.86209033	9.4634412	9.4646415
12	292 10 43.0	1 34 50.7	+2 53.0	−2 0 54.2	−4 31.3	9.86214546	9.4662897	9.4683752
14	295 20 24.1	1 34 50.5	2 57.8	2 9 45.4	4 19.8	9.86219193	9.4708842	9.4737990
16	298 30 5.2	1 34 50.6	3 0.4	2 18 12.9	4 7.5	9.86222967	9.4771023	9.4807737
18	301 39 46.8	1 34 51.0	3 0.9	2 26 15.1	3 54.5	9.86225856	9.4847925	9.4891374
20	304 49 29.2	1 34 51.5	2 59.2	2 33 50.5	3 40.8	9.86227849	9.4937856	9.4987141
22	307 59 13.0	1 34 52.3	+2 55.3	−2 40 57.9	−3 26.4	9.86228940	9.5039005	9.5093227
24	311 8 58.6	1 34 53.3	2 49.2	2 47 35.8	3 11.4	9.86229125	9.5149588	9.5207875
26	314 18 46.4	1 34 54.5	2 41.1	2 53 43.2	2 55.8	9.86228407	9.5267886	9.5329427
28	317 28 36.8	1 34 55.9	2 31.1	2 59 18.9	2 39.7	9.86226783	9.5392316	9.5456381
30	320 38 30.1	1 34 57.4	2 19.2	3 4 21.8	2 23.1	9.86224260	9.5521459	9.5587393
Aug. 1	323 48 26.7	1 34 59.1	+2 5.6	−3 8 51.2	−2 6.1	9.86220845	9.5654044	9.5721280
3	326 58 26.8	1 35 1.0	1 50.4	3 12 46.0	1 48.7	9.86216548	9.5788978	9.5857025
5	330 8 30.7	1 35 3.0	1 33.9	3 16 5.7	1 30.9	9.86211380	9.5925316	9.5993754
7	333 18 38.7	1 35 5.1	1 16.3	3 18 49.4	1 12.8	9.86205355	9.6062252	9.6130731
9	336 28 51.0	1 35 7.3	0 57.7	3 20 56.8	0 54.5	9.86198494	9.6199117	9.6267344
11	339 39 7.8	1 35 9.6	+0 38.4	−3 22 27.4	−0 36.0	9.86190814	9.6335350	9.6403074
13	342 49 29.4	1 35 12.0	+0 18.7	3 23 20.9	−0 17.4	9.86182338	9.6470469	9.6537488
15	345 59 55.8	1 35 14.5	−0 1.4	3 23 37.1	+0 1.2	9.86173093	9.6604088	9.6670230
17	349 10 27.3	1 35 17.0	0 21.3	3 23 15.9	0 20.0	9.86163105	9.6735884	9.6801023
19	352 21 4.0	1 35 19.6	0 41.1	3 22 17.3	0 38.6	9.86152405	9.6865622	9.6929661
21	355 31 45.9	1 35 22.3	−1 0.3	−3 20 41.4	+0 57.2	9.86141018	9.6993124	9.7055996
23	358 42 33.3	1 35 25.1	1 18.8	3 18 28.5	1 15.7	9.86128991	9.7118268	9.7179933
25	1 53 26.3	1 35 27.9	1 36.4	3 15 38.8	1 33.9	9.86116348	9.7240985	9.7301418
27	5 4 24.8	1 35 30.7	1 52.8	3 12 13.0	1 51.9	9.86103131	9.7361232	9.7420425
29	8 15 29.1	1 35 33.6	2 7.8	3 8 11.5	2 9.6	9.86089379	9.7478997	9.7536949
31	11 26 39.2	1 35 36.5	−2 21.2	−3 3 35.0	+2 26.9	9.86075137	9.7594283	9.7651002
Sept. 2	14 37 55.3	1 35 39.5	2 32.9	2 58 24.3	2 43.8	9.86060444	9.7707109	9.7762608
4	17 49 17.2	1 35 42.5	2 42.7	2 52 40.2	3 0.2	9.86045347	9.7817505	9.7871804
6	21 0 45.3	1 35 45.6	2 50.5	2 46 23.9	3 16.1	9.86029889	9.7925510	9.7978629
8	24 12 19.5	1 35 48.7	2 56.2	2 39 36.4	3 31.4	9.86014122	9.8031162	9.8083114
10	27 24 0.0	1 35 51.8	−2 59.7	−2 32 18.8	+3 46.1	9.85998092	9.8134488	9.8185286
12	30 35 46.8	1 35 55.0	3 1.0	2 24 32.6	4 0.1	9.85981849	9.8235512	9.8285171
14	33 47 39.9	1 35 58.2	3 0.0	2 16 19.0	4 13.4	9.85965442	9.8334268	9.8382806
16	36 59 39.6	1 36 1.5	2 56.8	2 7 39.6	4 25.9	9.85948924	9.8430791	9.8478227
18	40 11 45.8	1 36 4.8	2 51.4	1 58 35.9	4 37.6	9.85932343	9.8525122	9.8571480
20	43 23 58.7	1 36 8.1	−2 43.8	−1 49 9.5	+4 48.5	9.85915758	9.8617309	9.8662619
22	46 36 18.4	1 36 11.5	2 34.2	1 39 22.3	4 58.6	9.85899213	9.8707414	9.8751704
24	49 48 44.9	1 36 15.0	2 22.6	1 29 15.9	5 7.7	9.85882765	9.8795495	9.8838793
26	53 1 18.3	1 36 18.4	2 9.2	1 18 52.3	5 15.8	9.85866461	9.8881607	9.8923945
28	56 13 58.7	1 36 22.0	1 54.2	1 8 13.4	5 23.0	9.85850357	9.8965814	9.9007224
30	59 26 46.2	1 36 25.5	−1 37.8	−0 57 21.1	+5 29.1	9.85834503	9.9048180	9.9088687
Oct. 2	62 39 40.9	1 36 29.1	−1 20.1	−0 46 17.6	+5 34.2	9.85818950	9.9128756	9.9168396

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 2	62 39 40.9	1 36 29.1	−1 20.1	−0 46 17.6	+5 34.2	9.85818950	9.9128756	9.9168396
4	65 52 42.7	1 36 32.7	1 1.4	0 35 4.8	5 38.4	9.85803746	9.9207611	9.9246406
6	69 5 51.8	1 36 36.4	0 42.0	0 23 44.9	5 41.4	9.85788943	9.9284786	9.9322758
8	72 19 8.1	1 36 40.0	0 21.9	0 12 20.0	5 43.3	9.85774588	9.9360326	9.9397496
10	75 32 31.7	1 36 43.6	−0 1.5	−0 0 52.4	5 44.2	9.85760723	9.9434270	9.9470652
12	78 46 2.5	1 36 47.2	+0 18.8	+0 10 35.8	+5 43.9	9.85747396	9.9506645	9.9542254
14	81 59 40.6	1 36 50.8	0 39.0	0 22 2.4	5 42.5	9.85734648	9.9577478	9.9612324
16	85 13 25.8	1 36 54.4	0 58.6	0 33 25.2	5 40.1	9.85722522	9.9646796	9.9680898
18	88 27 18.0	1 36 57.9	1 17.5	0 44 42.0	5 36.5	9.85711055	9.9714634	9.9748010
20	91 41 17.2	1 37 1.3	1 35.5	0 55 50.7	5 31.9	9.85700289	9.9781029	9.9813695
22	94 55 23.2	1 37 4.7	+1 52.2	+1 6 48.9	+5 26.2	9.85690260	9.9846014	9.9877991
24	98 9 35.8	1 37 7.9	2 7.5	1 17 34.7	5 19.4	9.85680996	9.9909631	9.9940937
26	101 23 54.8	1 37 11.1	2 21.2	1 28 5.9	5 11.6	9.85672529	9.9971914	0.0002569
28	104 38 20.0	1 37 14.1	2 33.1	1 38 20.4	5 2.8	9.85664888	0.0032906	0.0062929
30	107 52 50.9	1 37 16.9	2 43.0	1 48 16.3	4 52.9	9.85658099	0.0092645	0.0122057
Nov. 1	111 7 27.4	1 37 19.6	+2 50.9	+1 57 51.6	+4 42.2	9.85652183	0.0151169	0.0179988
3	114 22 9.0	1 37 22.0	2 56.5	2 7 4.3	4 30.4	9.85647161	0.0208516	0.0236757
5	117 36 55.3	1 37 24.3	2 59.9	2 15 52.7	4 17.8	9.85643045	0.0264713	0.0292390
7	120 51 45.9	1 37 26.3	3 1.0	2 24 15.1	4 4.4	9.85639855	0.0319788	0.0346909
9	124 6 40.2	1 37 28.0	2 59.8	2 32 9.8	3 50.1	9.85637596	0.0373756	0.0400332
11	127 21 37.9	1 37 29.6	+2 56.2	+2 39 35.2	+3 35.2	9.85636277	0.0426637	0.0452670
13	130 36 38.2	1 37 30.8	2 50.4	2 46 29.8	3 19.4	9.85635904	0.0478436	0.0503938
15	133 51 40.7	1 37 31.7	2 42.4	2 52 52.4	3 3.0	9.85636476	0.0529178	0.0554156
17	137 6 44.8	1 37 32.3	2 32.3	2 58 41.6	2 46.1	9.85637992	0.0578877	0.0603344
19	140 21 49.7	1 37 32.6	2 20.3	3 3 56.4	2 28.6	9.85640448	0.0627558	0.0651517
21	143 36 54.8	1 37 32.5	+2 6.4	+3 8 35.6	+2 10.6	9.85643836	0.0675229	0.0698699
23	146 51 59.5	1 37 32.1	1 51.0	3 12 38.4	1 52.2	9.85648143	0.0721927	0.0744915
25	150 7 3.0	1 37 31.4	1 34.1	3 16 4.1	1 33.4	9.85653356	0.0767668	0.0790188
27	153 22 4.8	1 37 30.3	1 16.0	3 18 51.9	1 14.4	9.85659453	0.0812480	0.0834548
29	156 37 3.9	1 37 28.8	0 56.9	3 21 1.4	0 55.1	9.85666421	0.0856394	0.0878021
Dec. 1	159 51 59.8	1 37 27.0	+0 37.1	+3 22 32.2	+0 35.6	9.85674231	0.0899431	0.0920628
3	163 6 51.8	1 37 24.9	+0 16.9	3 23 24.0	+0 16.1	9.85682860	0.0941614	0.0962392
5	166 21 39.1	1 37 22.4	−0 3.6	3 23 36.6	−0 3.4	9.85692280	0.0982964	0.1003331
7	169 36 21.1	1 37 19.6	0 24.0	3 23 10.2	0 23.0	9.85702458	0.1023495	0.1043459
9	172 50 57.1	1 37 16.4	0 44.1	3 22 4.8	0 42.4	9.85713361	0.1063221	0.1082783
11	176 5 26.5	1 37 13.0	−1 3.6	+3 20 20.8	−1 1.6	9.85724955	0.1102145	0.1121309
13	179 19 48.7	1 37 9.2	1 22.4	3 17 58.4	1 20.7	9.85737201	0.1140277	0.1159048
15	182 34 3.1	1 37 5.2	1 40.0	3 14 58.3	1 39.4	9.85750061	0.1177625	0.1196010
17	185 48 9.1	1 37 0.9	1 56.3	3 11 21.1	1 57.8	9.85763490	0.1214203	0.1232205
19	189 2 6.4	1 36 56.4	2 11.2	3 7 7.5	2 15.7	9.85777446	0.1250018	0.1267644
21	192 15 54.4	1 36 51.6	−2 24.4	+3 2 18.5	−2 33.2	9.85791883	0.1285086	0.1302345
23	195 29 32.7	1 36 46.7	2 35.8	2 56 55.1	2 50.2	9.85806756	0.1319422	0.1336319
25	198 43 0.9	1 36 41.6	2 45.1	2 50 58.3	3 6.5	9.85822017	0.1353040	0.1369587
27	201 56 18.9	1 36 36.3	2 52.4	2 44 29.3	3 22.3	9.85837617	0.1385962	0.1402169
29	205 9 26.2	1 36 31.0	2 57.5	2 37 29.6	3 37.4	9.85853506	0.1418209	0.1434084
31	208 22 22.8	1 36 25.6	−3 0.4	+2 30 0.4	−3 51.7	9.85869634	0.1449796	0.1465350
33	211 35 8.5	1 36 20.1	−3 1.0	+2 22 3.3	−4 5.2	9.85885950		

MARS.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
		° ′ ″	′ ″	″	° ′ ″	′ ″			
Jan.	0	286 8 48.9	35 57.49	+48.8	−1 33 29.8	−0 37.58	0.15285998	0.3804250	0.3803337
	2	287 20 49.8	36 3.37	47.8	1 34 43.8	0 36.42	0.15227221	0.3802389	0.3801406
	4	288 33 2.4	36 9.18	46.8	1 35 55.5	0 35.26	0.15169512	0.3800389	0.3799338
	6	289 45 26.4	36 14.87	45.6	1 37 4.8	0 34.06	0.15112900	0.3798255	0.3797142
	8	290 58 1.8	36 20.47	44.4	1 38 11.8	0 32.85	0.15057419	0.3795999	0.3794827
	10	292 10 48.3	36 25.98	+43.0	−1 39 16.2	−0 31.60	0.15003099	0.3793628	0.3792403
	12	293 23 45.7	36 31.36	41.6	1 40 18.2	0 30.32	0.14949978	0.3791153	0.3789878
	14	294 36 53.7	36 36.64	40.2	1 41 17.5	0 29.04	0.14898083	0.3788579	0.3787257
	16	295 50 12.2	36 41.80	38.6	1 42 14.3	0 27.72	0.14847445	0.3785912	0.3784546
	18	297 3 40.9	36 46.84	37.0	1 43 8.4	0 26.36	0.14798093	0.3783157	0.3781747
	20	298 17 19.5	36 51.77	+35.3	−1 43 59.7	−0 25.00	0.14750065	0.3780315	0.3778863
	22	299 31 7.9	36 56.56	33.5	1 44 48.4	0 23.60	0.14703382	0.3777390	0.3775895
	24	300 45 5.7	37 1.20	31.6	1 45 34.2	0 22.20	0.14658075	0.3774380	0.3772844
	26	301 59 12.7	37 5.72	29.7	1 46 17.1	0 20.76	0.14614174	0.3771287	0.3769709
	28	303 13 28.6	37 10.12	27.8	1 46 57.2	0 19.32	0.14571707	0.3768109	0.3766487
	30	304 27 53.1	37 14.36	+25.8	−1 47 34.4	−0 17.84	0.14530698	0.3764843	0.3763179
Feb.	1	305 42 25.9	37 18.46	23.7	1 48 8.6	0 16.36	0.14491176	0.3761494	0.3759790
	3	306 57 6.8	37 22.38	21.6	1 48 39.8	0 14.84	0.14453165	0.3758067	0.3756323
	5	308 11 55.4	37 26.18	19.4	1 49 7.9	0 13.32	0.14416691	0.3754562	0.3752786
	7	309 26 51.5	37 29.83	17.2	1 49 33.0	0 11.78	0.14381779	0.3750995	0.3749189
	9	310 41 54.6	37 33.27	+15.0	−1 49 55.0	−0 10.23	0.14348449	0.3747368	0.3745534
	11	311 57 4.5	37 36.58	12.7	1 50 14.0	0 8.67	0.14316722	0.3743687	0.3741829
	13	313 12 20.9	37 39.74	10.4	1 50 29.7	0 7.10	0.14286625	0.3739959	0.3738079
	15	314 27 43.3	37 42.70	8.1	1 50 42.3	0 5.50	0.14258170	0.3736188	0.3734285
	17	315 43 11.6	37 45.50	5.8	1 50 51.8	0 3.92	0.14231382	0.3732372	0.3730449
	19	316 58 45.2	37 48.14	+ 3.4	−1 50 58.0	−0 2.32	0.14206277	0.3728515	0.3726570
	21	318 14 24.0	37 50.57	+ 1.0	1 51 1.0	−0 0.70	0.14182876	0.3724613	0.3722646
	23	319 30 7.4	37 52.85	− 1.3	1 51 0.8	+0 0.91	0.14161186	0.3720667	0.3718675
	25	320 45 55.2	37 54.93	3.7	1 50 57.4	0 2.52	0.14141229	0.3716670	0.3714652
	27	322 1 47.0	37 56.83	6.1	1 50 50.7	0 4.16	0.14123017	0.3712622	0.3710578
Mar.	1	323 17 42.4	37 58.54	− 8.4	−1 50 40.7	+0 5.78	0.14106563	0.3708520	0.3706448
	3	324 33 41.1	38 0.07	10.8	1 50 27.5	0 7.40	0.14091878	0.3704364	0.3702268
	5	325 49 42.6	38 1.42	13.1	1 50 11.1	0 9.02	0.14078971	0.3700160	0.3698040
	7	327 5 46.6	38 2.58	15.4	1 49 51.5	0 10.64	0.14067853	0.3695909	0.3693769
	9	328 21 52.8	38 3.55	17.6	1 49 28.6	0 12.26	0.14058529	0.3691618	0.3689462
	11	329 38 0.7	38 4.32	−19.9	−1 49 2.4	+0 13.86	0.14051010	0.3687295	0.3685118
	13	330 54 9.9	38 4.90	22.0	1 48 33.1	0 15.46	0.14045298	0.3682933	0.3680741
	15	332 10 20.2	38 5.29	24.2	1 48 0.6	0 17.06	0.14041396	0.3678542	0.3676336
	17	333 26 30.9	38 5.47	26.3	1 47 24.8	0 18.66	0.14039308	0.3674121	0.3671898
	19	334 42 41.9	38 5.48	28.4	1 46 45.9	0 20.24	0.14039036	0.3669667	0.3667426
	21	335 58 52.8	38 5.27	−30.4	−1 46 3.9	+0 21.80	0.14040581	0.3665176	0.3662917
	23	337 15 3.0	38 4.89	32.3	1 45 18.8	0 23.36	0.14043940	0.3660647	0.3658365
	25	338 31 12.2	38 4.32	34.2	1 44 30.5	0 24.89	0.14049110	0.3656071	0.3653765
	27	339 47 20.2	38 3.56	36.0	1 43 39.2	0 26.41	0.14056090	0.3651446	0.3649111
	29	341 3 26.4	38 2.60	37.7	1 42 44.9	0 27.92	0.14064874	0.3646762	0.3644397
	31	342 19 30.5	38 1.45	−39.4	−1 41 47.5	+0 29.40	0.14075455	0.3642017	0.3639622
Apr.	2	343 35 32.1	38 0.10	−41.0	−1 40 47.2	+0 30.88	0.14087831	0.3637213	0.3634787

MARS.

GREENWICH MEAN NOON.

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							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	′ ″			
Apr. 2	343 35 32.1	38 0.10	−41.0	−1 40 47.2	+0 30.88	0.14087831	0.3637213	0.3634787
4	344 51 30.8	37 58.59	42.4	1 39 44.1	0 32.32	0.14101984	0.3632347	0.3629893
6	346 7 26.3	37 56.88	43.9	1 38 38.0	0 33.75	0.14117910	0.3627425	0.3624943
8	347 23 18.2	37 54.97	45.2	1 37 29.1	0 35.16	0.14135599	0.3622448	0.3619939
10	348 39 6.1	37 52.89	46.4	1 36 17.4	0 36.53	0.14155034	0.3617417	0.3614881
12	349 54 49.6	37 50.63	−47.6	−1 35 3.0	+0 37.89	0.14176208	0.3612331	0.3609768
14	351 10 28.5	37 48.20	48.6	1 33 45.9	0 39.22	0.14199103	0.3607190	0.3604598
16	352 26 2.4	37 45.59	49.6	1 32 26.1	0 40.52	0.14223703	0.3601990	0.3599365
18	353 41 30.8	37 42.79	50.5	1 31 3.8	0 41.80	0.14249992	0.3596723	0.3594065
20	354 56 53.4	37 39.82	51.2	1 29 39.0	0 43.04	0.14277954	0.3591389	0.3588692
22	356 12 10.0	37 36.70	−51.9	−1 28 11.6	+0 44.26	0.14307567	0.3585975	0.3583237
24	357 27 20.2	37 33.41	52.5	1 26 41.9	0 45.45	0.14338811	0.3580477	0.3577692
26	358 42 23.6	37 29.95	52.9	1 25 9.9	0 46.61	0.14371669	0.3574881	0.3572045
28	359 57 19.9	37 26.34	53.3	1 23 35.5	0 47.74	0.14406117	0.3569182	0.3566292
30	1 12 8.9	37 22.58	53.6	1 21 58.9	0 48.83	0.14442131	0.3563376	0.3560433
May 2	2 26 50.1	37 18.65	−53.7	−1 20 20.2	+0 49.90	0.14479691	0.3557462	0.3554464
4	3 41 23.4	37 14.58	53.8	1 18 39.4	0 50.92	0.14518770	0.3551438	0.3548385
6	4 55 48.4	37 10.34	53.7	1 16 56.5	0 51.92	0.14559343	0.3545305	0.3542198
8	6 10 4.7	37 5.99	53.6	1 15 11.7	0 52.89	0.14601384	0.3539063	0.3535900
10	7 24 12.3	37 1.50	53.4	1 13 25.0	0 53.82	0.14644867	0.3532709	0.3529489
12	8 38 10.6	36 56.85	−53.0	−1 11 36.5	+0 54.70	0.14689763	0.3526239	0.3522960
14	9 51 59.6	36 52.09	52.6	1 9 46.2	0 55.57	0.14736047	0.3519650	0.3516309
16	11 5 38.9	36 47.20	52.1	1 7 54.2	0 56.39	0.14783687	0.3512936	0.3509529
18	12 19 8.4	36 42.17	51.4	1 6 0.6	0 57.18	0.14832655	0.3506088	0.3502611
20	13 32 27.6	36 37.04	50.7	1 4 5.5	0 57.94	0.14882920	0.3499098	0.3495547
22	14 45 36.4	36 31.78	−49.9	−1 2 8.9	+0 58.66	0.14934452	0.3491956	0.3488323
24	15 58 34.7	36 26.44	49.0	1 0 10.9	0 59.34	0.14987222	0.3484647	0.3480929
26	17 11 22.1	36 20.96	48.0	0 58 11.5	1 0.00	0.15041196	0.3477166	0.3473357
28	18 23 58.5	36 15.38	47.0	0 56 10.9	1 0.60	0.15096344	0.3469501	0.3465599
30	19 36 23.6	36 9.71	45.8	0 54 9.2	1 1.18	0.15152631	0.3461650	0.3457653
June 1	20 48 37.3	36 3.95	−44.6	−0 52 6.2	+1 1.72	0.15210028	0.3453609	0.3449517
3	22 0 39.3	35 58.08	43.3	0 50 2.3	1 2.22	0.15268503	0.3445377	0.3441189
5	23 12 29.6	35 52.15	41.9	0 47 57.4	1 2.70	0.15328021	0.3436953	0.3432667
7	24 24 7.9	35 46.14	40.5	0 45 51.5	1 3.14	0.15388545	0.3428330	0.3423943
9	25 35 34.0	35 40.02	39.0	0 43 44.9	1 3.54	0.15450045	0.3419505	0.3415017
11	26 46 47.9	35 33.85	−37.4	−0 41 37.4	+1 3.90	0.15512490	0.3410478	0.3405884
13	27 57 49.4	35 27.60	35.8	0 39 29.3	1 4.22	0.15575841	0.3401237	0.3396536
15	29 8 38.3	35 21.29	34.1	0 37 20.5	1 4.52	0.15640066	0.3391779	0.3386963
17	30 19 14.6	35 14.92	32.4	0 35 11.2	1 4.80	0.15705133	0.3382086	0.3377149
19	31 29 38.0	35 8.48	30.6	0 33 1.4	1 5.02	0.15771004	0.3372149	0.3367084
21	32 39 48.5	35 2.00	−28.7	−0 30 51.1	+1 5.22	0.15837648	0.3361954	0.3356758
23	33 49 45.9	34 55.48	26.8	0 28 40.5	1 5.40	0.15905032	0.3351493	0.3346158
25	34 59 30.3	34 48.90	24.9	0 26 29.6	1 5.52	0.15973118	0.3340752	0.3335275
27	36 9 1.5	34 42.26	23.0	0 24 18.4	1 5.64	0.16041875	0.3329725	0.3324103
29	37 18 19.4	34 35.60	21.0	0 22 7.0	1 5.70	0.16111270	0.3318407	0.3312637
July 1	38 27 23.9	34 28.92	−19.0	−0 19 55.6	+1 5.74	0.16181265	0.3306793	0.3300876
3	39 36 15.0	34 22.20	−17.0	−0 17 44.1	+1 5.76	0.16251834	0.3294884	0.3288817

MARS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	′ ″			
July 1	38 27 23.9	34 28.92	−19.0	−0 19 55.6	+1 5.74	0.16181265	0.3306793	0.3300876
3	39 36 15.0	34 22.20	17.0	0 17 44.1	1 5.76	0.16251834	0.3294884	0.3288817
5	40 44 52.7	34 15.44	14.9	0 15 32.6	1 5.75	0.16322936	0.3282674	0.3276452
7	41 53 16.8	34 8.67	12.8	0 13 21.1	1 5.70	0.16394541	0.3270153	0.3263776
9	43 1 27.3	34 1.86	10.8	0 11 9.8	1 5.62	0.16466614	0.3257324	0.3250790
11	44 9 24.2	33 55.05	− 8.7	−0 8 58.6	+1 5.52	0.16539127	0.3244176	0.3237479
13	45 17 7.5	33 48.24	6.6	0 6 47.7	1 5.40	0.16612042	0.3230699	0.3223836
15	46 24 37.2	33 41.40	4.5	0 4 37.1	1 5.24	0.16685333	0.3216886	0.3209849
17	47 31 53.1	33 34.54	2.4	0 2 26.7	1 5.06	0.16758962	0.3202722	0.3195499
19	48 38 55.4	33 27.70	− 0.3	−0 0 16.8	1 4.86	0.16832900	0.3188182	0.3180772
21	49 45 43.9	33 20.86	+ 1.8	+0 1 52.7	+1 4.62	0.16907120	0.3173265	0.3165660
23	50 52 18.8	33 14.02	3.9	0 4 1.7	1 4.38	0.16981583	0.3157955	0.3150150
25	51 58 40.0	33 7.17	6.0	0 6 10.1	1 4.10	0.17056263	0.3142243	0.3134233
27	53 4 47.5	33 0.33	8.0	0 8 18.0	1 3.79	0.17131131	0.3126120	0.3117904
29	54 10 41.3	32 53.50	10.1	0 10 25.3	1 3.46	0.17206155	0.3109584	0.3101158
31	55 16 21.5	32 46.71	+12.1	+0 12 31.9	+1 3.12	0.17281303	0.3092627	0.3083989
Aug. 2	56 21 48.1	32 39.91	14.1	0 14 37.8	1 2.76	0.17356550	0.3075245	0.3066393
4	57 27 1.2	32 33.14	16.0	0 16 42.9	1 2.38	0.17431866	0.3057433	0.3048364
6	58 32 0.7	32 26.39	18.0	0 18 47.3	1 1.98	0.17507221	0.3039185	0.3029896
8	59 36 46.8	32 19.68	19.9	0 20 50.8	1 1.54	0.17582589	0.3020494	0.3010980
10	60 41 19.4	32 12.96	+21.7	+0 22 53.4	+1 1.10	0.17657944	0.3001351	0.2991608
12	61 45 38.6	32 6.28	23.5	0 24 55.2	1 0.64	0.17733257	0.2981746	0.2971765
14	62 49 44.5	31 59.64	25.3	0 26 56.0	1 0.15	0.17808505	0.2961661	0.2951434
16	63 53 37.2	31 53.02	27.1	0 28 55.8	0 59.66	0.17883655	0.2941080	0.2930598
18	64 57 16.7	31 46.45	28.8	0 30 54.6	0 59.14	0.17958685	0.2919987	0.2909244
20	66 0 43.0	31 39.90	+30.4	+0 32 52.4	+0 58.62	0.18033570	0.2898368	0.2887358
22	67 3 56.3	31 33.40	32.1	0 34 49.1	0 58.08	0.18108288	0.2876212	0.2864929
24	68 6 56.6	31 26.96	33.6	0 36 44.7	0 57.52	0.18182809	0.2853508	0.2841950
26	69 9 44.1	31 20.52	35.1	0 38 39.1	0 56.95	0.18257113	0.2830252	0.2818413
28	70 12 18.7	31 14.12	36.6	0 40 32.4	0 56.36	0.18331174	0.2806433	0.2794312
30	71 14 40.6	31 7.80	+38.0	+0 42 24.5	+0 55.76	0.18404970	0.2782049	0.2769642
Sept. 1	72 16 50.0	31 1.52	39.3	0 44 15.4	0 55.15	0.18478479	0.2757090	0.2744393
3	73 18 46.8	30 55.28	40.6	0 46 5.1	0 54.52	0.18551679	0.2731551	0.2718563
5	74 20 31.1	30 49.10	41.9	0 47 53.5	0 53.88	0.18624547	0.2705427	0.2692141
7	75 22 3.2	30 42.97	43.1	0 49 40.6	0 53.23	0.18697063	0.2678705	0.2665118
9	76 23 23.0	30 36.88	+44.2	+0 51 26.4	+0 52.58	0.18769205	0.2651376	0.2637477
11	77 24 30.7	30 30.85	45.2	0 53 10.9	0 51.90	0.18840952	0.2623419	0.2609201
13	78 25 26.4	30 24.87	46.2	0 54 54.1	0 51.22	0.18912285	0.2594819	0.2580271
15	79 26 10.2	30 18.94	47.2	0 56 35.8	0 50.54	0.18983183	0.2565555	0.2550669
17	80 26 42.3	30 13.10	48.1	0 58 16.2	0 49.85	0.19053631	0.2535611	0.2520379
19	81 27 2.7	30 7.30	+48.9	+0 59 55.2	+0 49.14	0.19123609	0.2504972	0.2489389
21	82 27 11.5	30 1.54	49.6	1 1 32.8	0 48.42	0.19193098	0.2473628	0.2457689
23	83 27 8.9	29 55.86	50.3	1 3 8.9	0 47.70	0.19262076	0.2441569	0.2425269
25	84 26 55.0	29 50.24	51.0	1 4 43.6	0 46.98	0.19330532	0.2408786	0.2392120
27	85 26 29.9	29 44.68	51.5	1 6 16.8	0 46.24	0.19398447	0.2375269	0.2358236
29	86 25 53.7	29 39.20	+52.0	+1 7 48.5	+0 45.50	0.19465803	0.2341017	0.2323611
Oct. 1	87 25 6.6	29 33.76	+52.5	+1 9 18.8	+0 44.74	0.19532587	0.2306018	0.2288236

MARS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	′ ″			
Oct. 1	87 25 6.6	29 33.76	+52.5	+1 9 18.8	+0 44.74	0.19532587	0.2306018	0.2288236
3	88 24 8.8	29 28.38	52.8	1 10 47.5	0 43.99	0.19598780	0.2270264	0.2252101
5	89 23 0.2	29 23.10	53.2	1 12 14.7	0 43.24	0.19664366	0.2233747	0.2215199
7	90 21 41.2	29 17.86	53.4	1 13 40.4	0 42.47	0.19729331	0.2196455	0.2177512
9	91 20 11.7	29 12.68	53.6	1 15 4.6	0 41.69	0.19793661	0.2158367	0.2139019
11	92 18 31.9	29 7.58	+53.7	+1 16 27.2	+0 40.92	0.19857341	0.2119466	0.2099705
13	93 16 42.0	29 2.55	53.8	1 17 48.3	0 40.14	0.19920359	0.2079732	0.2059545
15	94 14 42.2	28 57.58	53.8	1 19 7.8	0 39.36	0.19982701	0.2039141	0.2018518
17	95 12 32.4	28 52.68	53.7	1 20 25.7	0 38.56	0.20044350	0.1997676	0.1976614
19	96 10 13.0	28 47.87	53.6	1 21 42.0	0 37.78	0.20105296	0.1955329	0.1933821
21	97 7 43.9	28 43.11	+53.4	+1 22 56.8	+0 36.98	0.20165525	0.1912088	0.1890127
23	98 5 5.4	28 38.42	53.2	1 24 10.0	0 36.18	0.20225026	0.1867939	0.1845525
25	99 2 17.6	28 33.81	52.8	1 25 21.6	0 35.38	0.20283791	0.1822882	0.1800009
27	99 59 20.7	28 29.26	52.5	1 26 31.5	0 34.58	0.20341801	0.1776905	0.1753571
29	100 56 14.7	28 24.80	52.1	1 27 39.9	0 33.78	0.20399048	0.1730005	0.1706206
31	101 52 59.9	28 20.40	+51.6	+1 28 46.6	+0 32.97	0.20455524	0.1682174	0.1657906
Nov. 2	102 49 36.4	28 16.06	51.1	1 29 51.8	0 32.16	0.20511214	0.1633403	0.1608665
4	103 46 4.2	28 11.82	50.5	1 30 55.3	0 31.34	0.20566110	0.1583688	0.1558471
6	104 42 23.7	28 7.64	49.9	1 31 57.1	0 30.54	0.20620202	0.1533010	0.1507304
8	105 38 34.8	28 3.52	49.2	1 32 57.4	0 29.72	0.20673479	0.1481350	0.1455144
10	106 34 37.8	27 59.48	+48.5	+1 33 56.0	+0 28.90	0.20725932	0.1428686	0.1401975
12	107 30 32.8	27 55.52	47.7	1 34 53.0	0 28.09	0.20777551	0.1375008	0.1347782
14	108 26 19.9	27 51.63	46.9	1 35 48.4	0 27.27	0.20828331	0.1320297	0.1292551
16	109 21 59.3	27 47.82	46.0	1 36 42.1	0 26.45	0.20878257	0.1264543	0.1236274
18	110 17 31.2	27 44.08	45.1	1 37 34.2	0 25.63	0.20927328	0.1207744	0.1178952
20	111 12 55.7	27 40.42	+44.1	+1 38 24.6	+0 24.81	0.20975530	0.1149899	0.1120584
22	112 8 12.9	27 36.82	43.1	1 39 13.4	0 23.99	0.21022855	0.1091008	0.1061171
24	113 3 23.0	27 33.29	42.0	1 40 0.6	0 23.17	0.21069299	0.1031074	0.1000718
26	113 58 26.1	27 29.85	40.9	1 40 46.1	0 22.35	0.21114855	0.0970105	0.0939237
28	114 53 22.5	27 26.48	39.8	1 41 30.0	0 21.53	0.21159512	0.0908114	0.0876738
30	115 48 12.1	27 23.18	+38.7	+1 42 12.2	+0 20.72	0.21203265	0.0845109	0.0813229
Dec. 2	116 42 55.2	27 19.98	37.4	1 42 52.9	0 19.90	0.21246110	0.0781098	0.0748715
4	117 37 32.0	27 16.84	36.2	1 43 31.8	0 19.08	0.21288036	0.0716082	0.0683200
6	118 32 2.6	27 13.75	34.9	1 44 9.2	0 18.26	0.21329040	0.0650068	0.0616687
8	119 26 27.1	27 10.76	33.6	1 44 44.9	0 17.44	0.21369114	0.0583057	0.0549181
10	120 20 45.7	27 7.84	+32.3	+1 45 19.0	+0 16.63	0.21408251	0.0515060	0.0480697
12	121 14 58.5	27 5.00	30.9	1 45 51.4	0 15.81	0.21446449	0.0446094	0.0411253
14	122 9 5.8	27 2.22	29.5	1 46 22.2	0 15.00	0.21483700	0.0376181	0.0340882
16	123 3 7.4	26 59.54	28.1	1 46 51.4	0 14.18	0.21519997	0.0305361	0.0269623
18	123 57 3.8	26 56.91	26.6	1 47 18.9	0 13.37	0.21555341	0.0233676	0.0197526
20	124 50 55.1	26 54.36	+25.1	+1 47 44.9	+0 12.56	0.21589721	0.0161182	0.0124651
22	125 44 41.3	26 51.89	23.6	1 48 9.2	0 11.74	0.21623133	0.0087942	0.0051064
24	126 38 22.7	26 49.49	22.1	1 48 31.8	0 10.94	0.21655578	0.0014028	9.9976845
26	127 31 59.3	26 47.17	20.6	1 48 52.9	0 10.13	0.21687046	9.9939526	9.9902082
28	128 25 31.4	26 44.92	19.0	1 49 12.4	0 9.32	0.21717536	9.9864525	9.9826866
30	129 18 59.0	26 42.76	+17.5	+1 49 30.2	+0 8.52	0.21747042	9.9789117	9.9751290
32	130 12 22.4	26 40.64	+15.9	+1 49 46.4	+0 7.72	0.21775559	9.9713400	

JUPITER.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
		° ′ ″	′ ″	″	° ′ ″	″			
Jan.	2	234 39 9.6	4 39.08	−26.9	+0 55 21.0	−4.53	0.7311484	0.7851337	0.7835829
	6	234 57 46.1	4 39.19	26.9	0 55 2.9	4.55	0.7310682	0.7819777	0.7803188
	10	235 16 23.1	4 39.29	26.9	0 54 44.6	4.58	0.7309874	0.7786071	0.7768433
	14	235 35 0.4	4 39.39	26.8	0 54 26.3	4.60	0.7309062	0.7750280	0.7731621
	18	235 53 38.2	4 39.50	26.8	0 54 7.8	4.63	0.7308246	0.7712461	0.7692808
	22	236 12 16.4	4 39.60	−26.8	+0 53 49.2	−4.66	0.7307426	0.7672669	0.7652052
	26	236 30 55.0	4 39.71	26.8	0 53 30.5	4.68	0.7306601	0.7630967	0.7609421
	30	236 49 34.1	4 39.81	26.8	0 53 11.8	4.71	0.7305772	0.7587429	0.7565002
Feb.	3	237 8 13.6	4 39.92	26.7	0 52 52.9	4.73	0.7304936	0.7542157	0.7518909
	7	237 26 53.5	4 40.03	26.7	0 52 33.9	4.76	0.7304096	0.7495274	0.7471269
	11	237 45 33.8	4 40.14	−26.7	+0 52 14.8	−4.78	0.7303252	0.7446910	0.7422211
	15	238 4 14.6	4 40.24	26.6	0 51 55.6	4.81	0.7302404	0.7397189	0.7371860
	19	238 22 55.8	4 40.35	26.6	0 51 36.4	4.83	0.7301551	0.7346241	0.7320347
	23	238 41 37.4	4 40.46	26.6	0 51 17.0	4.86	0.7300692	0.7294202	0.7267826
	27	239 0 19.5	4 40.58	26.5	0 50 57.5	4.88	0.7299829	0.7241245	0.7214480
Mar.	3	239 19 2.0	4 40.69	−26.5	+0 50 37.9	−4.90	0.7298962	0.7187562	0.7160519
	7	239 37 45.0	4 40.80	26.4	0 50 18.3	4.93	0.7298090	0.7133378	0.7106168
	11	239 56 28.4	4 40.91	26.4	0 49 58.5	4.95	0.7297214	0.7078918	0.7051658
	15	240 15 12.3	4 41.03	26.3	0 49 38.6	4.98	0.7296333	0.7024417	0.6997224
	19	240 33 56.6	4 41.14	26.3	0 49 18.7	5.00	0.7295447	0.6970112	0.6943110
	23	240 52 41.4	4 41.26	−26.2	+0 48 58.6	−5.03	0.7294557	0.6916255	0.6889579
	27	241 11 26.7	4 41.37	26.1	0 48 38.5	5.05	0.7293663	0.6863124	0.6836928
	31	241 30 12.4	4 41.49	26.1	0 48 18.2	5.07	0.7292765	0.6811033	0.6785481
Apr.	4	241 48 58.6	4 41.61	26.0	0 47 57.9	5.10	0.7291861	0.6760313	0.6735572
	8	242 7 45.2	4 41.72	25.9	0 47 37.4	5.12	0.7290953	0.6711295	0.6687523
	12	242 26 32.4	4 41.84	−25.9	+0 47 16.9	−5.14	0.7290041	0.6664296	0.6641653
	16	242 45 20.0	4 41.96	25.8	0 46 56.3	5.17	0.7289125	0.6619633	0.6598275
	20	243 4 8.0	4 42.08	25.7	0 46 35.6	5.19	0.7288204	0.6577619	0.6557708
	24	243 22 56.6	4 42.20	25.6	0 46 14.7	5.22	0.7287279	0.6538580	0.6520277
	28	243 41 45.6	4 42.32	25.5	0 45 53.8	5.24	0.7286349	0.6502840	0.6486313
May	2	244 0 35.1	4 42.44	−25.4	+0 45 32.8	−5.26	0.7285415	0.6470729	0.6456124
	6	244 19 25.1	4 42.56	25.3	0 45 11.8	5.28	0.7284477	0.6442526	0.6429966
	10	244 38 15.6	4 42.68	25.2	0 44 50.6	5.30	0.7283535	0.6418466	0.6408053
	14	244 57 6.6	4 42.80	25.1	0 44 29.3	5.33	0.7282588	0.6398745	0.6390563
	18	245 15 58.0	4 42.93	25.0	0 44 8.0	5.35	0.7281637	0.6383526	0.6377655
	22	245 34 50.0	4 43.05	−24.9	+0 43 46.5	−5.37	0.7280682	0.6372959	0.6369450
	26	245 53 42.5	4 43.18	24.8	0 43 25.0	5.39	0.7279724	0.6367135	0.6366024
	30	246 12 35.4	4 43.30	24.7	0 43 3.4	5.42	0.7278762	0.6366113	0.6367408
June	3	246 31 28.9	4 43.43	24.6	0 42 41.7	5.44	0.7277795	0.6369897	0.6373575
	7	246 50 22.9	4 43.56	24.4	0 42 19.9	5.46	0.7276824	0.6378421	0.6384419
	11	247 9 17.4	4 43.68	−24.3	+0 41 58.0	−5.48	0.7275849	0.6391550	0.6399795
	15	247 28 12.3	4 43.81	24.2	0 41 36.0	5.50	0.7274870	0.6409130	0.6419532
	19	247 47 7.8	4 43.94	24.0	0 41 14.0	5.52	0.7273887	0.6430976	0.6443439
	23	248 6 3.8	4 44.07	23.9	0 40 51.8	5.54	0.7272900	0.6456891	0.6471305
	27	248 25 0.4	4 44.20	23.8	0 40 29.6	5.57	0.7271909	0.6486642	0.6502868
July	1	248 43 57.4	4 44.33	−23.6	+0 40 7.3	−5.59	0.7270914	0.6519941	0.6537822
	5	249 2 55.0	4 44.46	−23.5	+0 39 44.9	−5.61	0.7269915	0.6556469	0.6575842

JUPITER.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
July 1	248 43 57.4	4 44.33	−23.6	+0 40 7.3	−5.59	0.7270914	0.6519941	0.6537822
5	249 2 55.0	4 44.46	23.5	0 39 44.9	5.61	0.7269915	0.6556469	0.6575842
9	249 21 53.1	4 44.59	23.4	0 39 22.4	5.63	0.7268912	0.6595901	0.6616604
13	249 40 51.7	4 44.72	23.2	0 38 59.9	5.65	0.7267906	0.6637913	0.6659789
17	249 59 50.8	4 44.85	23.1	0 38 37.2	5.67	0.7266896	0.6682196	0.6705096
21	250 18 50.5	4 44.98	−22.9	+0 38 14.5	−5.69	0.7265882	0.6728450	0.6752222
25	250 37 50.7	4 45.11	22.7	0 37 51.7	5.71	0.7264864	0.6776372	0.6800860
29	250 56 51.4	4 45.25	22.6	0 37 28.9	5.73	0.7263842	0.6825646	0.6850691
Aug. 2	251 15 52.6	4 45.38	22.4	0 37 5.9	5.75	0.7262817	0.6875958	0.6901409
6	251 34 54.4	4 45.52	22.2	0 36 42.9	5.77	0.7261788	0.6927011	0.6952729
10	251 53 56.8	4 45.65	−22.1	+0 36 19.7	−5.79	0.7260755	0.6978534	0.7004396
14	252 12 59.7	4 45.78	21.9	0 35 56.5	5.81	0.7259719	0.7030287	0.7056180
18	252 32 3.1	4 45.92	21.7	0 35 33.3	5.83	0.7258679	0.7082050	0.7107871
22	252 51 7.0	4 46.06	21.6	0 35 9.9	5.85	0.7257635	0.7133614	0.7159251
26	253 10 11.5	4 46.20	21.4	0 34 46.5	5.87	0.7256588	0.7184756	0.7210104
30	253 29 16.6	4 46.33	−21.2	+0 34 23.0	−5.88	0.7255538	0.7235271	0.7260234
Sept. 3	253 48 22.2	4 46.47	21.0	0 33 59.4	5.90	0.7254485	0.7284973	0.7309465
7	254 7 28.4	4 46.61	20.8	0 33 35.8	5.92	0.7253429	0.7333696	0.7357648
11	254 26 35.1	4 46.75	20.6	0 33 12.1	5.94	0.7252369	0.7381307	0.7404659
15	254 45 42.4	4 46.89	20.4	0 32 48.3	5.96	0.7251305	0.7427689	0.7450382
19	255 4 50.2	4 47.03	−20.2	+0 32 24.4	−5.97	0.7250238	0.7472723	0.7494694
23	255 23 58.6	4 47.17	20.0	0 32 0.5	5.99	0.7249168	0.7516282	0.7537472
27	255 43 7.6	4 47.31	19.8	0 31 36.5	6.01	0.7248095	0.7558252	0.7578606
Oct. 1	256 2 17.1	4 47.45	19.6	0 31 12.4	6.03	0.7247018	0.7598526	0.7618000
5	256 21 27.2	4 47.60	19.4	0 30 48.2	6.05	0.7245938	0.7637021	0.7655579
9	256 40 37.9	4 47.74	−19.2	+0 30 24.0	−6.06	0.7244855	0.7673670	0.7691290
13	256 59 49.1	4 47.88	19.0	0 29 59.7	6.08	0.7243769	0.7708428	0.7725076
17	257 19 0.9	4 48.03	18.8	0 29 35.4	6.10	0.7242679	0.7741225	0.7756869
21	257 38 13.3	4 48.17	18.5	0 29 11.0	6.11	0.7241586	0.7771999	0.7786604
25	257 57 26.3	4 48.32	18.3	0 28 46.5	6.13	0.7240490	0.7800680	0.7814218
29	258 16 39.9	4 48.46	−18.1	+0 28 21.9	−6.15	0.7239391	0.7827215	0.7839665
Nov. 2	258 35 54.0	4 48.61	17.9	0 27 57.3	6.16	0.7238289	0.7851565	0.7862911
6	258 55 8.7	4 48.75	17.6	0 27 32.6	6.18	0.7237185	0.7873701	0.7883934
10	259 14 24.0	4 48.90	17.4	0 27 7.8	6.19	0.7236078	0.7893605	0.7902713
14	259 33 39.9	4 49.05	17.2	0 26 43.0	6.21	0.7234968	0.7911251	0.7919214
18	259 52 56.4	4 49.20	−16.9	+0 26 18.2	−6.23	0.7233855	0.7926599	0.7933401
22	260 12 13.5	4 49.35	16.7	0 25 53.2	6.24	0.7232739	0.7939615	0.7945237
26	260 31 31.2	4 49.50	16.5	0 25 28.2	6.26	0.7231619	0.7950265	0.7954699
30	260 50 49.5	4 49.64	16.2	0 25 3.1	6.27	0.7230496	0.7958539	0.7961784
Dec. 4	261 10 8.4	4 49.79	16.0	0 24 38.0	6.29	0.7229371	0.7964435	0.7966493
8	261 29 27.8	4 49.94	−15.8	+0 24 12.8	−6.30	0.7228244	0.7967954	0.7968821
12	261 48 47.9	4 50.09	15.5	0 23 47.6	6.32	0.7227115	0.7969090	0.7968757
16	262 8 8.6	4 50.24	15.3	0 23 22.3	6.33	0.7225983	0.7967821	0.7966281
20	262 27 29.9	4 50.40	15.0	0 22 56.9	6.35	0.7224849	0.7964136	0.7961384
24	262 46 51.8	4 50.55	14.8	0 22 31.5	6.36	0.7223712	0.7958025	0.7954059
28	263 6 14.3	4 50.70	−14.5	+0 22 6.1	−6.38	0.7222572	0.7949489	0.7944319
32	263 25 37.4	4 50.86	−14.3	+0 21 40.5	−6.39	0.7221429	0.7938551	

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
Jan. 2	266 33 33.5	1 48.31	−1 17.4	+1 6 6.1	−4.22	1.0028967	1.0421403	1.0418035
6	266 40 46.8	1 48.31	1 17.2	1 5 49.3	4.22	1.0029020	1.0414263	1.0410090
10	266 48 0.0	1 48.31	1 16.9	1 5 32.4	4.23	1.0029072	1.0405520	1.0400558
14	266 55 13.2	1 48.31	1 16.7	1 5 15.5	4.23	1.0029123	1.0395207	1.0389472
18	267 2 26.5	1 48.30	1 16.4	1 4 58.5	4.24	1.0029173	1.0383355	1.0376860
22	267 9 39.7	1 48.30	−1 16.1	+1 4 41.6	−4.24	1.0029222	1.0369991	1.0362750
26	267 16 52.9	1 48.30	1 15.9	1 4 24.6	4.25	1.0029271	1.0355142	1.0347173
30	267 24 6.0	1 48.29	1 15.6	1 4 7.6	4.25	1.0029316	1.0338848	1.0330172
Feb. 3	267 31 19.2	1 48.29	1 15.4	1 3 50.6	4.25	1.0029361	1.0321153	1.0311801
7	267 38 32.4	1 48.29	1 15.1	1 3 33.6	4.26	1.0029405	1.0302123	1.0292127
11	267 45 45.5	1 48.29	−1 14.8	+1 3 16.6	−4.26	1.0029448	1.0281820	1.0271212
15	267 52 58.7	1 48.28	1 14.6	1 2 59.5	4.27	1.0029490	1.0260309	1.0249121
19	268 0 11.8	1 48.28	1 14.3	1 2 42.5	4.27	1.0029531	1.0237656	1.0225921
23	268 7 24.9	1 48.28	1 14.1	1 2 25.4	4.27	1.0029571	1.0213927	1.0201681
27	268 14 38.0	1 48.28	1 13.8	1 2 8.3	4.28	1.0029610	1.0189196	1.0176483
Mar. 3	268 21 51.1	1 48.28	−1 13.6	+1 1 51.2	−4.28	1.0029647	1.0163554	1.0150421
7	268 29 4.2	1 48.27	1 13.3	1 1 34.0	4.28	1.0029683	1.0137097	1.0123598
11	268 36 17.3	1 48.27	1 13.0	1 1 16.9	4.29	1.0029718	1.0109935	1.0096121
15	268 43 30.4	1 48.27	1 12.7	1 0 59.7	4.29	1.0029752	1.0082170	1.0068094
19	268 50 43.5	1 48.27	1 12.4	1 0 42.6	4.29	1.0029785	1.0053908	1.0039624
23	268 57 56.5	1 48.27	−1 12.1	+1 0 25.4	−4.30	1.0029816	1.0025256	1.0010819
27	269 5 9.6	1 48.27	1 11.9	1 0 8.2	4.30	1.0029847	0.9996329	0.9981802
31	269 12 22.7	1 48.26	1 11.6	0 59 51.0	4.31	1.0029877	0.9967257	0.9952710
Apr. 4	269 19 35.7	1 48.26	1 11.4	0 59 33.7	4.31	1.0029906	0.9938179	0.9923682
8	269 26 48.8	1 48.26	1 11.1	0 59 16.5	4.32	1.0029934	0.9909238	0.9894865
12	269 34 1.8	1 48.26	−1 10.9	+0 58 59.2	−4.32	1.0029960	0.9880578	0.9866393
16	269 41 14.9	1 48.26	1 10.6	0 58 41.9	4.32	1.0029985	0.9852327	0.9838399
20	269 48 27.9	1 48.26	1 10.3	0 58 24.6	4.33	1.0030009	0.9824627	0.9811026
24	269 55 40.9	1 48.26	1 10.0	0 58 7.3	4.33	1.0030032	0.9797616	0.9784416
28	270 2 54.0	1 48.26	1 9.7	0 57 49.9	4.33	1.0030054	0.9771446	0.9758728
May 2	270 10 7.0	1 48.25	−1 9.4	+0 57 32.6	−4.34	1.0030075	0.9746279	0.9734118
6	270 17 20.0	1 48.25	1 9.1	0 57 15.2	4.34	1.0030094	0.9722263	0.9710733
10	270 24 33.0	1 48.25	1 8.8	0 56 57.9	4.35	1.0030112	0.9699543	0.9688709
14	270 31 46.0	1 48.25	1 8.5	0 56 40.5	4.35	1.0030129	0.9678246	0.9668170
18	270 38 59.0	1 48.25	1 8.2	0 56 23.1	4.36	1.0030145	0.9658497	0.9649241
22	270 46 12.0	1 48.25	−1 7.9	+0 56 5.6	−4.36	1.0030160	0.9640418	0.9632046
26	270 53 25.0	1 48.25	1 7.6	0 55 48.2	4.36	1.0030173	0.9624137	0.9616707
30	271 0 38.0	1 48.25	1 7.3	0 55 30.7	4.36	1.0030185	0.9609769	0.9603336
June 3	271 7 51.0	1 48.25	1 7.0	0 55 13.3	4.37	1.0030196	0.9597416	0.9592021
7	271 15 4.0	1 48.25	1 6.7	0 54 55.8	4.37	1.0030206	0.9587158	0.9582836
11	271 22 17.0	1 48.25	−1 6.4	+0 54 38.3	−4.38	1.0030215	0.9579059	0.9575833
15	271 29 29.9	1 48.25	1 6.1	0 54 20.8	4.38	1.0030222	0.9573164	0.9571057
19	271 36 42.9	1 48.25	1 5.8	0 54 3.3	4.38	1.0030228	0.9569515	0.9568543
23	271 43 55.9	1 48.24	1 5.5	0 53 45.7	4.39	1.0030233	0.9568142	0.9568317
27	271 51 8.9	1 48.24	1 5.2	0 53 28.2	4.39	1.0030237	0.9569067	0.9570391
July 1	271 58 21.8	1 48.24	−1 4.9	+0 53 10.6	−4.39	1.0030240	0.9572284	0.9574744
5	272 5 34.8	1 48.24	−1 4.6	+0 52 53.0	−4.40	1.0030242	0.9577763	0.9581337

SATURN.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
July 1	271 58 21.8	1 48.24	−1 4.9	+0 53 10.6	−4.39	1.0030240	0.9572284	0.9574744
5	272 5 34.8	1 48.24	1 4.6	0 52 53.0	4.40	1.0030242	0.9577763	0.9581337
9	272 12 47.8	1 48.24	1 4.3	0 52 35.4	4.40	1.0030243	0.9585456	0.9590114
13	272 20 0.8	1 48.24	1 4.0	0 52 17.8	4.40	1.0030243	0.9595301	0.9601008
17	272 27 13.7	1 48.24	1 3.7	0 52 0.2	4.41	1.0030241	0.9607225	0.9613945
21	272 34 26.7	1 48.24	−1 3.4	+0 51 42.5	−4.41	1.0030238	0.9621157	0.9628850
25	272 41 39.7	1 48.24	1 3.1	0 51 24.9	4.41	1.0030234	0.9637011	0.9645629
29	272 48 52.6	1 48.24	1 2.8	0 51 7.2	4.42	1.0030229	0.9654686	0.9664167
Aug. 2	272 56 5.6	1 48.24	1 2.4	0 50 49.6	4.42	1.0030223	0.9674054	0.9684332
6	273 3 18.6	1 48.24	1 2.1	0 50 31.9	4.42	1.0030215	0.9694982	0.9705988
10	273 10 31.5	1 48.24	−1 1.8	+0 50 14.2	−4.43	1.0030206	0.9717333	0.9729001
14	273 17 44.5	1 48.24	1 1.5	0 49 56.5	4.43	1.0030196	0.9740975	0.9753240
18	273 24 57.5	1 48.24	1 1.2	0 49 38.7	4.44	1.0030185	0.9765778	0.9778574
22	273 32 10.4	1 48.24	1 0.8	0 49 21.0	4.44	1.0030172	0.9791607	0.9804860
26	273 39 23.4	1 48.24	1 0.5	0 49 3.2	4.44	1.0030160	0.9818313	0.9831948
30	273 46 36.4	1 48.24	−1 0.2	+0 48 45.5	−4.44	1.0030145	0.9845745	0.9859685
Sept. 3	273 53 49.3	1 48.24	0 59.9	0 48 27.7	4.45	1.0030129	0.9873749	0.9887919
7	274 1 2.3	1 48.24	0 59.6	0 48 9.9	4.45	1.0030112	0.9902179	0.9916511
11	274 8 15.3	1 48.24	0 59.2	0 47 52.1	4.45	1.0030095	0.9930899	0.9945329
15	274 15 28.3	1 48.25	0 58.9	0 47 34.2	4.46	1.0030077	0.9959784	0.9974247
19	274 22 41.2	1 48.25	−0 58.6	+0 47 16.4	−4.46	1.0030057	0.9988703	1.0003134
23	274 29 54.2	1 48.25	0 58.3	0 46 58.6	4.46	1.0030036	1.0017525	1.0031859
27	274 37 7.2	1 48.25	0 57.9	0 46 40.7	4.47	1.0030013	1.0046121	1.0060292
Oct. 1	274 44 20.2	1 48.25	0 57.6	0 46 22.8	4.47	1.0029989	1.0074360	1.0088309
5	274 51 33.2	1 48.25	0 57.2	0 46 4.9	4.47	1.0029964	1.0102127	1.0115800
9	274 58 46.2	1 48.25	−0 56.9	+0 45 47.0	−4.48	1.0029938	1.0129317	1.0142667
13	275 5 59.2	1 48.25	0 56.6	0 45 29.1	4.48	1.0029911	1.0155838	1.0168819
17	275 13 12.2	1 48.25	0 56.3	0 45 11.2	4.48	1.0029883	1.0181598	1.0194162
21	275 20 25.2	1 48.25	0 55.9	0 44 53.3	4.48	1.0029854	1.0206500	1.0218599
25	275 27 38.2	1 48.25	0 55.6	0 44 35.4	4.49	1.0029823	1.0230449	1.0242037
29	275 34 51.2	1 48.26	−0 55.3	+0 44 17.4	−4.49	1.0029791	1.0253358	1.0264397
Nov. 2	275 42 4.2	1 48.26	0 54.9	0 43 59.4	4.49	1.0029758	1.0275148	1.0285602
6	275 49 17.3	1 48.26	0 54.6	0 43 41.5	4.50	1.0029724	1.0295756	1.0305599
10	275 56 30.3	1 48.26	0 54.2	0 43 23.5	4.50	1.0029690	1.0315126	1.0324330
14	276 3 43.3	1 48.26	0 53.9	0 43 5.5	4.50	1.0029655	1.0333205	1.0341741
18	276 10 56.4	1 48.26	−0 53.5	+0 42 47.4	−4.51	1.0029618	1.0349931	1.0357768
22	276 18 9.4	1 48.26	0 53.2	0 42 29.4	4.51	1.0029579	1.0365247	1.0372359
26	276 25 22.5	1 48.27	0 52.8	0 42 11.4	4.51	1.0029539	1.0379100	1.0385466
30	276 32 35.6	1 48.27	0 52.5	0 41 53.3	4.51	1.0029498	1.0391453	1.0397057
Dec. 4	276 39 48.6	1 48.27	0 52.1	0 41 35.3	4.52	1.0029456	1.0402276	1.0407108
8	276 47 1.7	1 48.27	−0 51.8	+0 41 17.2	−4.52	1.0029413	1.0411549	1.0415596
12	276 54 14.8	1 48.27	0 51.4	0 40 59.1	4.52	1.0029369	1.0419246	1.0422497
16	277 1 27.9	1 48.28	0 51.1	0 40 41.0	4.53	1.0029324	1.0425343	1.0427782
20	277 8 41.0	1 48.28	0 50.7	0 40 22.9	4.53	1.0029278	1.0429813	1.0431432
24	277 15 54.1	1 48.28	0 50.4	0 40 4.8	4.53	1.0029230	1.0432640	1.0433433
28	277 23 7.2	1 48.28	−0 50.0	+0 39 46.7	−4.53	1.0029181	1.0433814	1.0433781
32	277 30 20.4	1 48.29	−0 49.7	+0 39 28.5	−4.54	1.0029131	1.0433338	

URANUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth.	
							At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 2	248 40 27.0	43.31	−1.6	+0 3 57.4	−0.58	1.2786006	1.2972151	1.2963973
10	248 46 13.5	43.30	1.6	0 3 52.7	0.58	1.2786341	1.2954956	1.2945142
18	248 51 59.9	43.30	1.5	0 3 48.1	0.58	1.2786676	1.2934572	1.2923276
26	248 57 46.3	43.29	1.5	0 3 43.4	0.58	1.2787011	1.2911304	1.2898697
Feb. 3	249 3 32.5	43.28	1.5	0 3 38.8	0.58	1.2787346	1.2885514	1.2871812
11	249 9 18.8	43.27	−1.4	+0 3 34.1	−0.58	1.2787681	1.2857656	1.2843105
19	249 15 5.0	43.27	1.4	0 3 29.4	0.58	1.2788016	1.2828221	1.2813067
27	249 20 51.1	43.26	1.4	0 3 24.8	0.58	1.2788351	1.2797710	1.2782222
Mar. 7	249 26 37.2	43.26	1.3	0 3 20.2	0.58	1.2788686	1.2766684	1.2751174
15	249 32 23.2	43.25	1.3	0 3 15.5	0.58	1.2789021	1.2735764	1.2720525
23	249 38 9.2	43.24	−1.3	+0 3 10.9	−0.58	1.2789356	1.2705532	1.2690858
31	249 43 55.2	43.24	1.2	0 3 6.2	0.58	1.2789691	1.2676584	1.2662788
Apr. 8	249 49 41.1	43.23	1.2	0 3 1.6	0.58	1.2790026	1.2649546	1.2636925
16	249 55 26.9	43.22	1.2	0 2 56.9	0.58	1.2790361	1.2624988	1.2613799
24	250 1 12.7	43.22	1.1	0 2 52.2	0.58	1.2790696	1.2603417	1.2593902
May 2	250 6 58.4	43.21	−1.1	+0 2 47.6	−0.58	1.2791030	1.2585316	1.2577708
10	250 12 44.1	43.20	1.1	0 2 42.9	0.58	1.2791365	1.2571115	1.2565571
18	250 18 29.7	43.20	1.0	0 2 38.3	0.58	1.2791700	1.2561101	1.2557736
26	250 24 15.2	43.19	1.0	0 2 33.6	0.58	1.2792034	1.2555494	1.2554394
June 3	250 30 0.8	43.18	1.0	0 2 29.0	0.58	1.2792369	1.2554444	1.2555631
11	250 35 46.2	43.18	−0.9	+0 2 24.3	−0.58	1.2792703	1.2557951	1.2561385
19	250 41 31.6	43.17	0.9	0 2 19.7	0.58	1.2793037	1.2565910	1.2571509
27	250 47 17.0	43.16	0.9	0 2 15.0	0.58	1.2793372	1.2578151	1.2585799
July 5	250 53 2.3	43.16	0.9	0 2 10.4	0.58	1.2793706	1.2594403	1.2603913
13	250 58 47.6	43.15	0.8	0 2 5.7	0.58	1.2794040	1.2614271	1.2625426
21	251 4 32.7	43.14	−0.8	+0 2 1.1	−0.58	1.2794374	1.2637324	1.2649906
29	251 10 17.9	43.14	0.8	0 1 56.4	0.58	1.2794708	1.2663104	1.2676846
Aug. 6	251 16 3.0	43.13	0.7	0 1 51.8	0.58	1.2795042	1.2691059	1.2705672
14	251 21 48.0	43.12	0.7	0 1 47.1	0.58	1.2795376	1.2720614	1.2735825
22	251 27 33.0	43.12	0.7	0 1 42.5	0.58	1.2795709	1.2751229	1.2766759
30	251 33 17.9	43.11	−0.6	+0 1 37.8	−0.58	1.2796043	1.2782335	1.2797886
Sept. 7	251 39 2.8	43.11	0.6	0 1 33.2	0.58	1.2796377	1.2813344	1.2828640
15	251 44 47.6	43.10	0.6	0 1 28.5	0.58	1.2796710	1.2843718	1.2858517
23	251 50 32.4	43.09	0.5	0 1 23.9	0.58	1.2797044	1.2872970	1.2887014
Oct. 1	251 56 17.1	43.08	0.5	0 1 19.2	0.58	1.2797377	1.2900590	1.2913641
9	252 2 1.8	43.08	−0.5	+0 1 14.6	−0.58	1.2797710	1.2926125	1.2937989
17	252 7 46.4	43.07	0.5	0 1 9.9	0.58	1.2798043	1.2949195	1.2959693
25	252 13 31.0	43.06	0.4	0 1 5.3	0.58	1.2798376	1.2969439	1.2978392
Nov. 2	252 19 15.5	43.06	0.4	0 1 0.6	0.58	1.2798709	1.2986520	1.2993795
10	252 24 59.9	43.05	0.4	0 0 56.0	0.58	1.2799041	1.3000194	1.3005693
18	252 30 44.3	43.04	−0.3	+0 0 51.4	−0.58	1.2799374	1.3010267	1.3013895
26	252 36 28.7	43.04	0.3	0 0 46.7	0.58	1.2799707	1.3016560	1.3018251
Dec. 4	252 42 13.0	43.03	0.3	0 0 42.1	0.58	1.2800039	1.3018967	1.3018708
12	252 47 57.2	43.02	0.2	0 0 37.4	0.58	1.2800371	1.3017473	1.3015263
20	252 53 41.4	43.02	0.2	0 0 32.8	0.58	1.2800704	1.3012081	1.3007935
28	252 59 25.5	43.01	−0.2	+0 0 28.1	−0.58	1.2801036	1.3002841	1.2996826
36	253 5 9.6	43.00	−0.1	+0 0 23.5	−0.58	1.2801368		

NEPTUNE.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth.	
							At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
Jan. 2	85 42 11.4	21.90	−49.7	−1 15 28.6	+0.48	1.4752569	1.4613145	1.4616481
10	85 45 6.5	21.90	49.7	1 15 24.8	0.48	1.4752586	1.4620511	1.4625215
18	85 48 1.7	21.90	49.7	1 15 20.9	0.48	1.4752604	1.4630560	1.4636518
26	85 50 56.9	21.90	49.7	1 15 17.1	0.48	1.4752622	1.4643054	1.4650139
Feb. 3	85 53 52.1	21.90	49.7	1 15 13.3	0.48	1.4752640	1.4657725	1.4665769
11	85 56 47.2	21.90	−49.7	−1 15 9.4	+0.48	1.4752658	1.4674222	1.4683038
19	85 59 42.4	21.89	49.7	1 15 5.6	0.48	1.4752676	1.4692171	1.4701576
27	86 2 37.5	21.89	49.7	1 15 1.7	0.48	1.4752694	1.4711202	1.4721002
Mar. 7	86 5 32.7	21.89	49.7	1 14 57.9	0.48	1.4752712	1.4730923	1.4740909
15	86 8 27.9	21.89	49.7	1 14 54.0	0.48	1.4752731	1.4750915	1.4760894
23	86 11 23.0	21.89	−49.7	−1 14 50.2	+0.48	1.4752749	1.4770803	1.4780597
31	86 14 18.1	21.89	49.7	1 14 46.3	0.48	1.4752768	1.4790231	1.4799657
Apr. 8	86 17 13.3	21.89	49.7	1 14 42.4	0.48	1.4752786	1.4808837	1.4817730
16	86 20 8.4	21.89	49.7	1 14 38.5	0.48	1.4752805	1.4826304	1.4834523
24	86 23 3.6	21.89	49.7	1 14 34.7	0.48	1.4752824	1.4842357	1.4849773
May 2	86 25 58.7	21.89	−49.7	−1 14 30.8	+0.49	1.4752843	1.4856743	1.4863234
10	86 28 53.8	21.89	49.7	1 14 26.9	0.49	1.4752862	1.4869229	1.4874704
18	86 31 48.9	21.89	49.7	1 14 23.0	0.49	1.4752881	1.4879644	1.4884032
26	86 34 44.1	21.89	49.7	1 14 19.1	0.49	1.4752900	1.4887852	1.4891083
June 3	86 37 39.2	21.89	49.7	1 14 15.2	0.49	1.4752919	1.4893720	1.4895752
11	86 40 34.3	21.89	−49.7	−1 14 11.4	+0.49	1.4752939	1.4897177	1.4897991
19	86 43 29.4	21.89	49.7	1 14 7.5	0.49	1.4752958	1.4898192	1.4897779
27	86 46 24.5	21.89	49.7	1 14 3.6	0.49	1.4752978	1.4896753	1.4895112
July 5	86 49 19.6	21.89	49.7	1 13 59.7	0.49	1.4752998	1.4892868	1.4890027
13	86 52 14.7	21.89	49.7	1 13 55.7	0.49	1.4753017	1.4886602	1.4882604
21	86 55 9.8	21.89	−49.7	−1 13 51.8	+0.49	1.4753037	1.4878049	1.4872950
29	86 58 4.9	21.89	49.7	1 13 47.9	0.49	1.4753057	1.4867328	1.4861202
Aug. 6	87 1 0.0	21.89	49.7	1 13 44.0	0.49	1.4753078	1.4854598	1.4847539
14	87 3 55.1	21.89	49.7	1 13 40.1	0.49	1.4753098	1.4840054	1.4832167
22	87 6 50.2	21.89	49.7	1 13 36.2	0.49	1.4753118	1.4823910	1.4815311
30	87 9 45.3	21.89	−49.7	−1 13 32.2	+0.49	1.4753139	1.4806411	1.4797246
Sept. 7	87 12 40.4	21.88	49.7	1 13 28.3	0.49	1.4753160	1.4787855	1.4778278
15	87 15 35.5	21.88	49.7	1 13 24.4	0.49	1.4753180	1.4768555	1.4758722
23	87 18 30.5	21.88	49.6	1 13 20.4	0.49	1.4753201	1.4748830	1.4738924
Oct. 1	87 21 25.6	21.88	49.6	1 13 16.5	0.49	1.4753222	1.4729052	1.4719265
9	87 24 20.7	21.88	−49.6	−1 13 12.6	+0.49	1.4753243	1.4709607	1.4700122
17	87 27 15.8	21.88	49.6	1 13 8.6	0.49	1.4753264	1.4690860	1.4681869
25	87 30 10.8	21.88	49.6	1 13 4.7	0.49	1.4753285	1.4673198	1.4664898
Nov. 2	87 33 5.9	21.88	49.6	1 13 0.7	0.49	1.4753306	1.4657012	1.4649586
10	87 36 1.0	21.88	49.6	1 12 56.7	0.49	1.4753328	1.4642657	1.4636263
18	87 38 56.0	21.88	−49.6	−1 12 52.8	+0.50	1.4753349	1.4630442	1.4625237
26	87 41 51.1	21.88	49.6	1 12 48.8	0.50	1.4753371	1.4620674	1.4616786
Dec. 4	87 44 46.1	21.88	49.6	1 12 44.9	0.50	1.4753393	1.4613590	1.4611113
12	87 47 41.2	21.88	49.6	1 12 40.9	0.50	1.4753415	1.4609361	1.4608350
20	87 50 36.2	21.88	49.6	1 12 36.9	0.50	1.4753437	1.4608084	1.4608575
28	87 53 31.3	21.88	−49.6	−1 12 33.0	+0.50	1.4753459	1.4609820	1.4611806
36	87 56 26.3	21.88	−49.6	−1 12 29.0	+0.50	1.4753481		

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Jan. 0	+0.1648123	+0.1734319	−818	−0.8892844	−0.8879013	− 87	−0.3857799	−0.3851796	−149
1	0.1820380	0.1906299	824	0.8864486	0.8849266	102	0.3845491	0.3838885	155
2	0.1992068	0.2077681	829	0.8833353	0.8816748	117	0.3831978	0.3824772	161
3	0.2163129	0.2248405	834	0.8799454	0.8781471	132	0.3817266	0.3809462	167
4	0.2333503	0.2418416	838	0.8762802	0.8743448	148	0.3801360	0.3792963	174
5	+0.2503137	+0.2587660	−842	−0.8723412	−0.8702696	−164	−0.3784271	−0.3775284	−180
6	0.2671977	0.2756080	846	0.8681301	0.8659229	180	0.3766002	0.3756427	186
7	0.2839965	0.2923625	850	0.8636482	0.8613064	196	0.3746560	0.3736402	192
8	0.3007053	0.3090243	853	0.8588976	0.8564223	212	0.3725954	0.3715218	199
9	0.3173189	0.3255885	856	0.8538805	0.8512725	229	0.3704194	0.3692882	205
10	+0.3338324	+0.3420500	−858	−0.8485985	−0.8458588	−246	−0.3681285	−0.3669403	−212
11	0.3502408	0.3584041	860	0.8430535	0.8401829	263	0.3657237	0.3644788	218
12	0.3665394	0.3746460	862	0.8372473	0.8342469	280	0.3632056	0.3619043	225
13	0.3827235	0.3907712	863	0.8311821	0.8280531	297	0.3605751	0.3592181	231
14	0.3987886	0.4067749	864	0.8248601	0.8216032	314	0.3578333	0.3564207	237
15	+0.4147297	+0.4226524	−864	−0.8182827	−0.8148989	−331	−0.3549805	−0.3535129	−244
16	0.4305425	0.4383994	864	0.8114522	0.8079428	349	0.3520180	0.3504958	250
17	0.4462224	0.4540110	864	0.8043709	0.8007366	367	0.3489464	0.3473701	257
18	0.4617647	0.4694827	863	0.7970404	0.7932825	385	0.3457668	0.3441366	263
19	0.4771646	0.4848098	862	0.7894631	0.7855826	403	0.3424798	0.3407964	270
20	+0.4924178	+0.4999879	−860	−0.7816411	−0.7776390	−421	−0.3390866	−0.3373505	−277
21	0.5075195	0.5150121	857	0.7735766	0.7694542	439	0.3355881	0.3337996	283
22	0.5224651	0.5298780	854	0.7652720	0.7610304	457	0.3319852	0.3301450	290
23	0.5372502	0.5445810	851	0.7567297	0.7523701	475	0.3282791	0.3263876	296
24	0.5518698	0.5591162	847	0.7479520	0.7434756	493	0.3244707	0.3225285	303
25	+0.5663195	+0.5734792	−843	−0.7389413	−0.7343494	−511	−0.3205612	−0.3185688	−309
26	0.5805946	0.5876653	838	0.7297004	0.7249945	529	0.3165518	0.3145100	316
27	0.5946906	0.6016699	833	0.7202321	0.7154136	547	0.3124436	0.3103529	322
28	0.6086026	0.6154882	827	0.7105392	0.7056093	566	0.3082380	0.3060990	329
29	0.6223261	0.6291156	821	0.7006243	0.6955849	585	0.3039362	0.3017497	335
30	+0.6358563	+0.6425475	−814	−0.6904913	−0.6853439	−603	−0.2995398	−0.2973066	−342
31	0.6491888	0.6557795	807	0.6801431	0.6748895	621	0.2950503	0.2927710	348
Feb. 1	0.6623192	0.6688073	800	0.6695834	0.6642253	639	0.2904691	0.2881447	354
2	0.6752432	0.6816265	792	0.6588158	0.6533553	657	0.2857980	0.2834292	360
3	0.6879567	0.6942334	783	0.6478444	0.6422834	674	0.2810385	0.2786262	366
4	+0.7004560	+0.7066242	−774	−0.6366729	−0.6310133	−692	−0.2761924	−0.2737374	−372
5	0.7127374	0.7187953	765	0.6253051	0.6195489	709	0.2712614	0.2687645	377
6	0.7247974	0.7307433	755	0.6137452	0.6078944	726	0.2662470	0.2637092	383
7	0.7366326	0.7424649	745	0.6019970	0.5960537	743	0.2611512	0.2585733	389
8	0.7482399	0.7539571	735	0.5900648	0.5840308	760	0.2559756	0.2533583	395
9	+0.7596162	+0.7652168	−724	−0.5779521	−0.5718293	−777	−0.2507217	−0.2480660	−400
10	0.7707584	0.7762408	712	0.5656628	0.5594532	794	0.2453911	0.2426976	406
11	0.7816636	0.7870264	700	0.5532010	0.5469067	811	0.2399856	0.2372553	412
12	0.7923289	0.7975707	687	0.5405704	0.5341929	827	0.2345069	0.2317405	418
13	0.8027514	0.8078707	674	0.5277747	0.5213163	843	0.2289564	0.2261549	423
14	+0.8129282	+0.8179237	−661	−0.5148182	−0.5082805	−859	−0.2233361	−0.2205002	−428
15	+0.8228568	+0.8277270	−647	−0.5017042	−0.4950897	−875	−0.2176474	−0.2147779	−433

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Feb. 15	+0.8228568	+0.8277270	-647	-0.5017042	-0.4950897	- 875	-0.2176474	-0.2147779	-433
16	0.8325340	0.8372777	633	0.4884371	0.4817472	890	0.2118919	0.2089898	438
17	0.8419576	0.8465733	619	0.4750203	0.4682572	905	0.2060716	0.2031376	443
18	0.8511245	0.8556110	604	0.4614582	0.4546238	920	0.2001879	0.1972229	448
19	0.8600323	0.8643882	589	0.4477544	0.4408507	935	0.1942427	0.1912476	453
20	+0.8686783	+0.8729023	-573	-0.4339131	-0.4269422	- 950	-0.1882377	-0.1852133	-458
21	0.8770598	0.8811506	557	0.4199385	0.4129024	964	0.1821747	0.1791220	462
22	0.8851743	0.8891307	541	0.4058344	0.3987350	978	0.1760555	0.1729754	467
23	0.8930194	0.8968401	524	0.3916049	0.3844445	992	0.1698820	0.1667754	471
24	0.9005924	0.9042760	507	0.3772545	0.3700353	1005	0.1636560	0.1605239	475
25	+0.9078907	+0.9114362	-490	-0.3627875	-0.3555118	-1018	-0.1573794	-0.1542228	-479
26	0.9149121	0.9183181	472	0.3482086	0.3408784	1031	0.1510543	0.1478741	483
27	0.9216540	0.9249194	454	0.3335219	0.3261397	1043	0.1446826	0.1414799	487
28	0.9281142	0.9312380	436	0.3187324	0.3113006	1055	0.1382664	0.1350423	491
Mar. 1	0.9342907	0.9372720	417	0.3038450	0.2963661	1067	0.1318079	0.1285634	494
2	+0.9401816	+0.9430194	-398	-0.2888647	-0.2813413	-1079	-0.1253092	-0.1220455	-497
3	0.9457851	0.9484787	379	0.2737966	0.2662309	1090	0.1187726	0.1154907	500
4	0.9511000	0.9536487	359	0.2586452	0.2510403	1101	0.1122002	0.1089014	503
5	0.9561248	0.9585282	339	0.2434167	0.2357748	1111	0.1055944	0.1022795	506
6	0.9608588	0.9631163	319	0.2281153	0.2204388	1121	0.0989570	0.0956271	509
7	+0.9653008	+0.9674122	-299	-0.2127460	-0.2050375	-1131	-0.0922902	-0.0889465	-512
8	0.9694503	0.9714151	278	0.1973139	0.1895756	1141	0.0855962	0.0822396	515
9	0.9733066	0.9751246	257	0.1818234	0.1740578	1150	0.0788769	0.0755084	518
10	0.9768691	0.9785400	236	0.1662795	0.1584891	1159	0.0721344	0.0687551	520
11	0.9801372	0.9816607	215	0.1506870	0.1428738	1167	0.0653707	0.0619815	522
12	+0.9831105	+0.9844864	-193	-0.1350502	-0.1272167	-1175	-0.0585878	-0.0551896	-524
13	0.9857885	0.9870168	171	0.1193738	0.1115222	1183	0.0517874	0.0483814	526
14	0.9881711	0.9892514	149	0.1036624	0.0957949	1191	0.0449718	0.0415588	528
15	0.9902577	0.9911900	127	0.0879203	0.0800393	1198	0.0381427	0.0347238	530
16	0.9920482	0.9928323	105	0.0721523	0.0642599	1205	0.0313023	0.0278784	531
17	+0.9935423	+0.9941781	- 82	-0.0563627	-0.0484612	-1212	-0.0244524	-0.0210245	-532
18	0.9947397	0.9952271	59	0.0405560	0.0326476	1218	0.0175948	0.0141639	533
19	0.9956403	0.9959793	36	0.0247366	0.0168236	1224	0.0107318	0.0072988	534
20	0.9962441	0.9964347	- 13	-0.0089091	-0.0009938	1229	-0.0038651	-0.0004310	535
21	0.9965510	0.9965929	+ 10	+0.0069218	+0.0148373	1234	+0.0030032	+0.0064374	535
22	+0.9965606	+0.9964540	+ 33	+0.0227521	+0.0306655	-1239	+0.0098712	+0.0133045	-535
23	0.9962732	0.9960180	57	0.0385769	0.0464858	1243	0.0167370	0.0201683	535
24	0.9956885	0.9952847	81	0.0543917	0.0622940	1247	0.0235983	0.0270267	535
25	0.9948067	0.9942544	105	0.0701920	0.0780851	1251	0.0304532	0.0338775	535
26	0.9936278	0.9929271	129	0.0859727	0.0938543	1254	0.0372994	0.0407188	535
27	+0.9921522	+0.9913032	+153	+0.1017292	+0.1095969	-1256	+0.0441352	+0.0475484	-535
28	0.9903801	0.9893830	177	0.1174567	0.1253079	1258	0.0509582	0.0543642	534
29	0.9883120	0.9871671	201	0.1331500	0.1409822	1260	0.0577662	0.0611638	533
30	0.9859486	0.9846566	225	0.1488040	0.1566149	1262	0.0645569	0.0679452	532
31	0.9832910	0.9818522	250	0.1644141	0.1722011	1263	0.0713284	0.0747061	531
32	+0.9803402	+0.9787553	+274	+0.1799751	+0.1877355	-1264	+0.0780784	+0.0814447	-530
33	+0.9770976	+0.9753673	+299	+0.1954818	+0.2032133	-1265	+0.0848048	+0.0881584	-529

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Apr. 1	+0.9803402	+0.9787553	+ 274	+0.1799751	+0.1877355	−1264	+0.0780784	+0.0814447	−530
2	0.9770976	0.9753673	299	0.1954818	0.2032133	1265	0.0848048	0.0881584	529
3	0.9735647	0.9716899	323	0.2109294	0.2186296	1265	0.0915054	0.0948455	527
4	0.9697432	0.9677247	348	0.2263133	0.2339800	1265	0.0981785	0.1015040	525
5	0.9656348	0.9634736	373	0.2416290	0.2492597	1264	0.1048218	0.1081317	523
6	+0.9612414	+0.9589384	+ 398	+0.2568717	+0.2644644	−1263	+0.1114335	+0.1147270	−520
7	0.9565649	0.9541211	423	0.2720373	0.2795898	1262	0.1180120	0.1212881	517
8	0.9516073	0.9490238	448	0.2871214	0.2946316	1261	0.1245552	0.1278130	514
9	0.9463705	0.9436480	473	0.3021199	0.3095857	1259	0.1310613	0.1342999	511
10	0.9408564	0.9379960	498	0.3170285	0.3244479	1257	0.1375286	0.1407471	508
11	+0.9350670	+0.9320698	+ 523	+0.3318434	+0.3392143	−1255	+0.1439553	+0.1471529	−505
12	0.9290046	0.9258716	548	0.3465602	0.3538807	1252	0.1503397	0.1535154	501
13	0.9226710	0.9194032	573	0.3611753	0.3684433	1248	0.1566799	0.1598330	497
14	0.9160684	0.9126668	598	0.3756844	0.3828981	1244	0.1629744	0.1661040	493
15	0.9091988	0.9056647	623	0.3900840	0.3972415	1240	0.1692215	0.1723267	489
16	+0.9020646	+0.8983988	+ 648	+0.4043701	+0.4114694	−1236	+0.1754194	+0.1784994	−485
17	0.8946677	0.8908714	673	0.4185389	0.4255782	1231	0.1815665	0.1846205	481
18	0.8870103	0.8830846	699	0.4325867	0.4395640	1226	0.1876612	0.1906883	476
19	0.8790945	0.8750405	724	0.4465096	0.4534229	1220	0.1937017	0.1967011	471
20	0.8709227	0.8667414	749	0.4603036	0.4671512	1214	0.1996863	0.2026571	466
21	+0.8624970	+0.8581896	+ 774	+0.4739651	+0.4807448	−1207	+0.2056133	+0.2085547	−461
22	0.8538196	0.8493874	799	0.4874899	0.4941998	1200	0.2114810	0.2143919	456
23	0.8448931	0.8403369	824	0.5008742	0.5075128	1193	0.2172874	0.2201674	450
24	0.8357193	0.8310406	849	0.5141148	0.5206795	1186	0.2230315	0.2258793	444
25	0.8263013	0.8215017	874	0.5272065	0.5336955	1178	0.2287107	0.2315255	438
26	+0.8166420	+0.8117226	+ 898	+0.5401459	+0.5465571	−1170	+0.2343236	+0.2371047	−432
27	0.8067438	0.8017062	923	0.5529286	0.5592601	1162	0.2398685	0.2426148	426
28	0.7966101	0.7914559	947	0.5655509	0.5718006	1153	0.2453435	0.2480543	420
29	0.7862441	0.7809750	972	0.5780086	0.5841746	1144	0.2507471	0.2534216	413
30	0.7756492	0.7702671	996	0 5902981	0.5963786	1134	0.2560777	0.2587150	406
May 1	+0.7648291	+0.7593358	+1021	+0.6024156	+0.6084086	−1124	+0.2613335	+0.2639330	−399
2	0.7537876	0.7481850	1045	0.6143574	0.6202616	1113	0.2665132	0.2690740	392
3	0.7425284	0.7368183	1070	0.6261206	0.6319340	1102	0.2716153	0.2741368	384
4	0.7310551	0.7252394	1094	0.6377015	0.6434227	1091	0.2766385	0.2791201	376
5	0.7193715	0.7134521	1118	0.6490972	0.6547246	1079	0.2815814	0.2840224	368
6	+0.7074815	+0.7014603	+1142	+0.6603047	+0.6658370	−1067	+0.2864429	+0.2888426	−360
7	0.6953889	0.6892679	1166	0.6713212	0.6767569	1054	0.2912215	0.2935794	352
8	0.6830976	0.6768785	1189	0.6821438	0.6874816	1041	0.2959161	0.2982317	344
9	0.6706111	0.6642961	1213	0.6927699	0.6980082	1028	0.3005258	0.3027982	336
10	0.6579337	0.6515244	1236	0.7031963	0.7083341	1014	0.3050488	0.3072777	327
11	+0.6450687	+0.6385671	+1259	+0.7134211	+0.7184570	−1000	+0.3094846	+0.3116694	−318
12	0.6320201	0.6254280	1282	0.7234414	0.7283742	986	0.3138319	0.3159719	309
13	0.6187915	0.6121110	1305	0.7332550	0.7380834	971	0.3180894	0.3201842	300
14	0.6053870	0.5986199	1328	0.7428591	0.7475820	956	0.3222563	0.3243054	291
15	0.5918101	0.5849582	1351	0.7522518	0.7568680	940	0.3263314	0.3283342	282
16	+0.5780646	+0.5711296	+1373	+0.7614305	+0.7659388	− 924	+0.3303137	+0.3322697	−272
17	+0.5641538	+0.5571378	+1395	+0.7703928	+0.7747923	− 908	+0.3342022	+0.3361110	−262

FOR GREENWICH MEAN NOON AND MIDNIGHT

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox		Reduc. to Mean Eq x of Jan 0
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
May 17	+0.5641538	+0.5571378	+1395	+0.7703928	+0.7747923	−908	+0.3342022	+0.3361110	−262
18	0.5500820	0.5429868	1417	0.7791369	0.7834260	891	0.3379960	0.3398568	252
19	0.5358528	0.5286802	1439	0.7876596	0.7918374	874	0.3416936	0.3435062	242
20	0.5214696	0.5142214	1460	0.7959590	0.8000243	856	0.3452943	0 3470578	231
21	0.5069363	0.4996149	1481	0.8040328	0.8079842	838	0.3487967	0.3505108	221
22	+0.4922576	+0.4848646	+1502	+0.8118781	+0.8157143	−819	+0.3521999	+0.3538640	−210
23	0.4774366	0.4699741	1523	0.8194926	0.8232126	800	0.3555030	0.3571165	200
24	0.4624778	0.4549482	1543	0.8268740	0.8304766	781	0.3587046	0.3602672	189
25	0.4473858	0.4397911	1563	0.8340201	0.8375039	761	0.3618040	0.3633150	178
26	0.4321648	0.4245073	1583	0.8409280	0.8442922	741	0.3648000	0.3662590	167
27	+0.4168193	+0.4091015	+1603	+0.8475961	+0.8508394	−721	+0.3676919	+0.3690985	−156
28	0.4013544	0.3935785	1622	0.8540220	0.8571436	700	0.3704787	0.3718324	144
29	0.3857746	0.3779433	1641	0.8602039	0.8632028	679	0.3731595	0.3744600	133
30	0.3700851	0.3622007	1660	0.8661400	0.8690155	657	0.3757338	0.3769808	121
31	0.3542906	0.3463555	1679	0.8718289	0.8745801	635	0.3782009	0.3793940	109
June 1	+0.3383960	+0.3304127	+1697	+0.8772689	+0.8798952	−612	+0.3805601	+0.3816992	− 97
2	0.3224063	0.3143773	1715	0.8824589	0.8849597	589	0.3828111	0.3838957	86
3	0.3063262	0.2982537	1732	0.8873976	0.8897724	566	0.3849530	0.3859831	74
4	0.2901604	0.2820470	1749	0.8920841	0.8943325	542	0.3869858	0.3879610	62
5	0.2739139	0.2657618	1765	0.8965174	0.8986388	518	0.3889088	0.3898290	50
6	+0.2575913	+0.2494028	+1781	+0.9006965	+0.9026904	−494	+0.3907216	+0.3915867	− 38
7	0.2411971	0.2329748	1797	0.9046205	0.9064866	469	0.3924242	0.3932338	26
8	0.2247363	0.2164823	1812	0.9082888	0.9100269	444	0.3940157	0.3947698	− 13
9	0.2082133	0.1999299	1827	0.9117008	0.9133104	418	0.3954962	0.3961947	0
10	0.1916327	0.1833222	1841	0.9148558	0.9163368	392	0.3968654	0.3975082	+ 13
11	+0.1749990	+0.1666636	+1855	+0.9177534	+0.9191054	−366	+0.3981230	+0.3987099	+ 26
12	0.1583167	0.1499588	1869	0.9203928	0.9216156	339	0.3992687	0.3997994	39
13	0.1415903	0.1332118	1882	0.9227737	0.9238671	312	0.4003021	0.4007767	52
14	0.1248239	0.1164271	1895	0.9248957	0.9258594	285	0.4012232	0.4016415	65
15	0.1080219	0.0996089	1907	0.9267582	0.9275920	257	0.4020316	0.4023935	78
16	+0.0911887	+0.0827618	+1919	+0.9283608	+0.9290643	−229	+0.4027272	+0.4030325	+ 91
17	0.0743287	0.0658901	1930	0.9297026	0.9302757	200	0.4033095	0.4035581	105
18	0.0574465	0.0489983	1941	0.9307834	0.9312256	171	0.4037783	0.4039701	118
19	0.0405463	0.0320910	1951	0.9316022	0.9319132	142	0.4041334	0.4042682	131
20	0.0236330	+0.0151729	1960	0.9321586	0.9323384	113	0.4043745	0.4044522	144
21	+0.0067113	−0.0017512	+1969	+0.9324524	+0.9325006	− 83	+0.4045014	+0.4045220	+158
22	−0.0102140	0.0186764	1978	0.9324829	0.9323993	53	0.4045141	0.4044775	171
23	0.0271378	0.0355976	1986	0.9322497	0.9320343	− 23	0.4044122	0.4043184	185
24	0.0440551	0.0525098	1993	0.9317529	0.9314056	+ 7	0.4041959	0.4040448	199
25	0.0609610	0.0694080	2000	0.9309923	0.9305131	38	0.4038651	0.4036568	213
26	−0.0778501	−0.0862868	+2006	+0.9299680	+0.9293570	+ 69	+0.4034199	+0.4031545	+226
27	0.0947173	0.1031411	2012	0.9286802	0.9279377	100	0.4028606	0.4025382	240
28	0.1115575	0.1199660	2017	0.9271295	0.9262556	132	0.4021873	0.4018080	253
29	0.1283658	0.1367562	2021	0.9253162	0.9243114	164	0.4014002	0.4009641	267
30	0.1451368	0.1535069	2025	0.9232413	0.9221060	196	0.4004997	0.4000071	280
31	−0.1618659	−0.1702133	+2028	+0.9209056	+0.9196402	+229	+0.3994863	+0.3989373	+294
32	−0.1785483	−0.1868702	+2030	+0.9183099	+0.9169149	+261	+0.3983601	+0.3977548	+307

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date		X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
		Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
July	1	−0.1618659	−0.1702133	+2028	+0.9209056	+0.9196402	+ 229	+0.3994863	+0.3989373	+294
	2	0.1785483	0.1868702	2030	0.9183099	0.9169149	261	0.3983601	0.3977548	307
	3	0.1951786	0.2034730	2032	0.9154552	0.9139311	294	0.3971217	0.3964606	321
	4	0.2117527	0.2200171	2033	0.9123426	0.9106899	326	0.3957717	0.3950549	334
	5	0.2282657	0.2364979	2034	0.9089732	0.9071926	359	0.3943104	0.3935382	348
	6	−0.2447131	−0.2529107	+2034	+0.9053483	+0.9034404	+ 392	+0.3927384	+0.3919110	+362
	7	0.2610902	0.2692510	2034	0.9014692	0.8994347	425	0.3910562	0.3901739	376
	8	0.2773927	0.2855146	2033	0.8973371	0.8951767	458	0.3892643	0.3883274	390
	9	0.2936162	0.3016968	2030	0.8929536	0.8906679	492	0.3873634	0.3863723	403
	10	0.3097561	0.3177936	2027	0.8883199	0.8859097	525	0.3853541	0.3843089	416
	11	−0.3258088	−0.3338010	+2023	+0.8834376	+0.8809036	+ 559	+0.3832367	+0.3821378	+429
	12	0.3417698	0.3497147	2019	0.8783080	0.8756510	592	0.3810121	0.3798598	443
	13	0.3576351	0.3655306	2014	0.8729327	0.8701532	626	0.3786809	0.3774754	456
	14	0.3734006	0.3812446	2008	0.8673128	0.8644116	660	0.3762433	0.3749849	470
	15	0.3890622	0.3968528	2002	0.8614497	0.8584274	694	0.3737001	0.3723890	483
	16	−0.4046159	−0.4123507	+1995	+0.8553446	+0.8522018	+ 728	+0.3710517	+0.3696882	+496
	17	0.4200569	0.4277340	1987	0.8489989	0.8457362	762	0.3682987	0.3668832	509
	18	0.4353815	0.4429987	1979	0.8424138	0.8390319	796	0.3654417	0.3639745	522
	19	0.4505850	0.4581400	1970	0.8355908	0.8320905	830	0.3624815	0.3609628	535
	20	0.4656630	0.4731535	1960	0.8285314	0.8249136	864	0.3594185	0.3578488	548
	21	−0.4806109	−0.4880346	+1950	+0.8212373	+0.8175028	+ 898	+0.3562537	+0.3546332	+561
	22	0.4954240	0.5027786	1938	0.8137102	0.8098599	932	0.3529876	0.3513170	574
	23	0.5100978	0.5173811	1926	0.8059520	0.8019869	965	0.3496214	0.3479010	586
	24	0.5246279	0.5318376	1913	0.7979648	0.7938860	999	0.3461559	0.3443862	599
	25	0.5390096	0.5461435	1900	0.7897508	0.7855593	1032	0.3425921	0.3407736	611
	26	−0.5532386	−0.5602944	+1886	+0.7813122	+0.7770096	+1065	+0.3389309	+0.3370642	+624
	27	0.5673104	0.5742861	1871	0.7726518	0.7682391	1098	0.3351736	0.3332593	636
	28	0.5812209	0.5881142	1855	0.7637718	0.7592504	1131	0.3313213	0.3293599	648
	29	0.5949656	0.6017746	1839	0.7546752	0.7500465	1163	0.3273751	0.3253672	660
	30	0.6085408	0.6152635	1822	0.7453647	0.7406301	1196	0.3233362	0.3212824	672
	31	−0.6219423	−0.6285767	+1804	+0.7358430	+0.7310039	+1228	+0.3192059	+0.3171068	+684
Aug.	1	0.6351663	0.6417106	1785	0.7261130	0.7211708	1260	0.3149854	0.3128417	696
	2	0.6482091	0.6546614	1766	0.7161776	0.7111339	1292	0.3106760	0.3084883	707
	3	0.6610670	0.6674253	1746	0.7060400	0.7008964	1324	0.3062788	0.3040478	718
	4	0.6737361	0.6799990	1726	0.6957033	0.6904611	1355	0.3017953	0.2995216	729
	5	−0.6862134	−0.6923789	+1704	+0.6851703	+0.6798312	+1386	+0.2972269	+0.2949112	+740
	6	0.6984952	0.7045619	1682	0.6744443	0.6690099	1417	0.2925747	0.2902176	751
	7	0.7105785	0.7165447	1659	0.6635284	0.6580000	1447	0.2878400	0.2854422	762
	8	0.7224600	0.7283241	1636	0.6524255	0.6468051	1477	0.2830242	0.2805863	772
	9	0.7341367	0.7398974	1612	0.6411391	0.6354279	1507	0.2781287	0.2756514	783
	10	−0.7456057	−0.7512613	+1587	+0.6296719	+0.6238716	+1536	+0.2731546	+0.2706385	+793
	11	0.7568638	0.7624128	1562	0.6180272	0.6121390	1565	0.2681033	0.2655491	803
	12	0.7679079	0.7733490	1536	0.6062074	0.6002329	1594	0.2629760	0.2603842	813
	13	0.7787355	0.7840669	1510	0.5942158	0.5881564	1622	0.2577739	0.2551453	822
	14	0.7893430	0.7945634	1483	0.5820551	0.5759123	1650	0.2524984	0.2498334	831
	15	−0.7997276	−0.8048352	+1455	+0.5697283	+0.5635036	+1678	+0.2471506	+0.2444500	+840
	16	−0.8098857	−0.8148788	+1427	+0.5572385	+0.5509335	+1705	+0.2417319	+0.2389965	+849

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Aug. 16	−0.8098857	−0.8148788	+1427	+0.5572385	+0.5509335	+1705	+0.2417319	+0.2389965	+ 849
17	0.8198141	0.8246912	1398	0.5445889	0.5382049	1732	0.2362439	0.2334742	858
18	0.8295096	0.8342690	1368	0.5317822	0.5253213	1758	0.2306877	0.2278846	867
19	0.8389690	0.8436091	1338	0.5188225	0.5122862	1784	0.2250650	0.2222292	875
20	0.8481889	0.8527080	1307	0.5057130	0.4991033	1809	0.2193774	0.2165098	883
21	−0.8571661	−0.8615628	+1276	+0.4924576	+0.4857763	+1834	+0.2136266	+0.2107280	+ 891
22	0.8658977	0.8701705	1244	0.4790598	0.4723087	1858	0.2078142	0.2048854	899
23	0.8743808	0.8785282	1212	0.4655235	0.4587047	1882	0.2019418	0.1989836	907
24	0.8826124	0.8866330	1179	0.4518528	0.4449683	1906	0.1960111	0.1930246	915
25	0.8905897	0.8944822	1145	0.4380518	0.4311037	1929	0.1900242	0.1870101	922
26	−0.8983103	−0.9020735	+1111	+0.4241246	+0.4171150	+1951	+0.1839825	+0.1809418	+ 929
27	0.9057716	0.9094044	1076	0.4100755	0.4030064	1972	0.1778880	0.1748216	935
28	0.9129714	0.9164725	1041	0.3959084	0.3887820	1993	0.1717427	0.1686514	941
29	0.9199074	0.9232759	1006	0.3816277	0.3744461	2014	0.1655481	0.1624330	947
30	0.9265776	0.9298123	970	0.3672378	0.3600032	2034	0.1593064	0.1561683	953
31	−0.9329798	−0.9360799	+ 934	+0.3527430	+0.3454576	+2054	+0.1530190	+0.1498589	+ 958
Sept. 1	0.9391123	0.9420768	897	0.3381476	0.3308135	2073	0.1466882	0.1435070	963
2	0.9449733	0.9478015	860	0.3234559	0.3160753	2091	0.1403155	0.1371141	968
3	0.9505612	0.9532524	822	0.3086723	0.3012474	2108	0.1339030	0.1306825	973
4	0.9558747	0.9584280	784	0.2938012	0.2863342	2125	0.1274527	0.1242137	978
5	−0.9609122	−0.9633272	+ 745	+0.2788469	+0.2713398	+2141	+0.1209659	+0.1177095	+ 983
6	0.9656728	0.9679488	706	0.2638134	0.2562682	2157	0.1144447	0.1111718	987
7	0.9701550	0.9722913	667	0.2487049	0.2411240	2172	0.1078909	0.1046023	991
8	0.9743576	0.9763538	628	0.2335258	0.2259108	2187	0.1013062	0.0980028	995
9	0.9782797	0.9801351	588	0.2182796	0.2106327	2202	0.0946923	0.0913749	998
10	−0.9819199	−0.9836340	+ 548	+0.2029705	+0.1952936	+2215	+0.0880509	+0.0847205	+1001
11	0.9852771	0.9868491	507	0.1876025	0.1798976	2228	0.0813838	0.0780411	1003
12	0.9883499	0.9897792	466	0.1721794	0.1644485	2240	0.0746926	0.0713387	1005
13	0.9911368	0.9924227	425	0.1567054	0.1489505	2251	0.0679794	0.0646149	1007
14	0.9936366	0.9947784	384	0.1411845	0.1334078	2262	0.0612456	0.0578717	1009
15	−0.9958480	−0.9968450	+ 342	+0.1256210	+0.1178248	+2272	+0.0544935	+0.0511111	+1010
16	0.9977695	0.9986213	300	0.1100196	0.1022059	2281	0.0477248	0.0443349	1011
17	0.9994002	1.0001061	258	0.0943844	0.0865557	2290	0.0409417	0.0375453	1012
18	1.0007389	1.0012984	216	0.0787204	0.0708788	2298	0.0341461	0.0307442	1013
19	1.0017846	1.0021973	173	0.0630317	0.0551797	2306	0.0273400	0.0239337	1014
20	−1.0025365	−1.0028021	+ 130	+0.0473235	+0.0394637	+2313	+0.0205255	+0.0171158	+1014
21	1.0029940	1.0031121	87	0.0316008	0.0237354	2319	0.0137048	0.0102927	1014
22	1.0031565	1.0031270	+ 44	0.0158682	+0.0079996	2324	0.0068799	+0.0034666	1013
23	1.0030237	1.0028465	0	+0.0001304	−0.0077388	2328	+0.0000531	−0.0033604	1012
24	1.0025953	1.0022702	− 43	−0.0156074	0.0234750	2332	−0.0067737	0.0101865	1011
25	−1.0018712	−1.0013982	− 87	−0.0313408	−0.0392041	+2335	−0.0135985	−0.0170094	+1009
26	1.0008513	1.0002305	130	0.0470644	0.0549210	2338	0.0204190	0.0238269	1007
27	0.9995359	0.9987674	174	0.0627733	0.0706209	2340	0.0272329	0.0306368	1005
28	0.9979251	0.9970094	218	0.0784630	0.0862990	2341	0.0340383	0.0374373	1002
29	0.9960201	0.9949571	262	0.0941284	0.1019506	2342	0.0408335	0.0442264	999
30	−0.9938206	−0.9926108	− 306	−0.1097648	−0.1175704	+2342	−0.0476159	−0.0510016	+ 996
31	−0.9913276	−0.9899714	− 350	−0.1253669	−0.1331542	+2341	−0.0543834	−0.0577612	+ 993

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jah. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Oct. 1	−0.9913276	−0.9899714	− 350	−0.1253669	−0.1331542	+2341	−0.0543834	−0.0577612	+993
2	0.9885421	0.9870398	394	0.1409313	0.1486974	2339	0.0611347	0.0645035	989
3	0.9854647	0.9838170	439	0.1564521	0.1641946	2337	0.0678673	0.0712259	985
4	0.9820968	0.9803041	484	0.1719247	0.1796422	2334	0.0745791	0.0779269	981
5	0.9784392	0.9765022	528	0.1873462	0.1950359	2331	0.0812688	0.0846045	976
6	−0.9744933	−0.9724127	− 572	−0.2027108	−0.2103706	+2327	−0.0879339	−0.0912568	+971
7	0.9702604	0.9680363	616	0.2180147	0.2256426	2322	0.0945730	0.0978822	966
8	0.9657408	0.9633742	660	0.2332537	0.2408476	2316	0.1011842	0.1044789	960
9	0.9609364	0.9584276	704	0.2484238	0.2559816	2310	0.1077655	0.1110444	954
10	0.9558478	0.9531973	748	0.2635207	0.2710405	2303	0.1143152	0.1175776	948
11	−0.9504761	−0.9476844	− 792	−0.2785404	−0.2860200	+2296	−0.1208314	−0.1240763	+942
12	0.9448222	0.9418898	836	0.2934786	0.3009157	2287	0.1273122	0.1305388	935
13	0.9388873	0.9358147	880	0.3083308	0.3157232	2278	0.1337558	0.1369630	928
14	0.9326722	0.9294600	924	0.3230925	0.3304379	2268	0.1401601	0.1433469	920
15	0.9261783	0.9228271	968	0.3377591	0.3450557	2258	0.1465231	0.1496885	912
16	−0.9194067	−0.9159174	−1012	−0.3523269	−0.3595718	+2247	−0.1528429	−0.1559858	+904
17	0.9123594	0.9087327	1056	0.3667900	0.3739811	2236	0.1591172	0.1622367	895
18	0.9050377	0.9012746	1099	0.3811443	0.3882791	2224	0.1653442	0.1684393	886
19	0.8974436	0.8935450	1142	0.3953850	0.4024615	2211	0.1715218	0.1745914	877
20	0.8895790	0.8855456	1185	0.4095080	0.4165236	2197	0.1776480	0.1806914	867
21	−0.8814457	−0.8772792	−1228	−0.4235080	−0.4304606	+2183	−0.1837210	−0.1867368	+857
22	0.8730464	0.8687477	1271	0.4373808	0.4442680	2168	0.1897386	0.1927260	847
23	0.8643833	0.8599535	1313	0.4511216	0.4579413	2152	0.1956988	0.1986568	837
24	0.8554586	0.8508991	1355	0.4647262	0.4714759	2135	0.2015998	0.2045275	826
25	0.8462752	0.8415873	1397	0.4781899	0.4848676	2118	0.2074397	0.2103360	815
26	−0.8368358	−0.8320210	−1439	−0.4915084	−0.4981119	+2100	−0.2132163	−0.2160805	+804
27	0.8271434	0.8222033	1480	0.5046775	0.5112046	2082	0.2189282	0.2217593	793
28	0.8172010	0.8121370	1521	0.5176927	0.5241414	2063	0.2245735	0.2273706	781
29	0.8070116	0.8018254	1562	0.5305501	0.5369183	2043	0.2301503	0.2329126	769
30	0.7965787	0.7912719	1603	0.5432455	0.5495313	2023	0.2356571	0.2383837	756
31	−0.7859054	−0.7804797	−1644	−0.5557752	−0.5619766	+2002	−0.2410921	−0.2437822	+743
Nov. 1	0.7749951	0.7694521	1684	0.5681351	0.5742504	1980	0.2464537	0.2491064	730
2	0.7638512	0.7581928	1724	0.5803220	0.5863494	1958	0.2517401	0.2543547	717
3	0.7524774	0.7467053	1764	0.5923321	0.5982699	1935	0.2569501	0.2595260	703
4	0.7408770	0.7349929	1803	0.6041622	0.6100086	1912	0.2620822	0.2646186	689
5	−0.7290533	−0.7230587	−1842	−0.6158088	−0.6215623	+1888	−0.2671350	−0.2696311	+675
6	0.7170096	0.7109063	1880	0.6272688	0.6329278	1863	0.2721068	0.2745620	660
7	0.7047492	0.6985387	1918	0.6385390	0.6441018	1838	0.2769964	0.2794098	645
8	0.6922753	0.6859593	1956	0.6496160	0.6550812	1812	0.2818021	0.2841732	630
9	0.6795912	0.6731714	1994	0.6604966	0.6658622	1785	0.2865228	0.2888506	615
10	−0.6667003	−0.6601782	−2031	−0.6711774	−0.6764418	+1758	−0.2911566	−0.2934405	+600
11	0.6536057	0.6469831	2068	0.6816549	0.6868164	1730	0.2957022	0.2979414	584
12	0.6403110	0.6335898	2104	0.6919258	0.6969827	1701	0.3001580	0.3023518	568
13	0.6268197	0.6200015	2140	0.7019866	0.7069372	1671	0.3045225	0.3066701	552
14	0.6131357	0.6062226	2175	0.7118339	0.7166764	1641	0.3087943	0.3108949	535
15	−0.5992629	−0.5922570	−2210	−0.7214643	−0.7261970	+1610	−0.3129718	−0.3150247	+518
16	−0.5852053	−0.5781084	−2244	−0.7308742	−0.7354955	+1579	−0.3170536	−0.3190581	+501

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
Nov. 16	−0.5852053	−0.5781084	−2244	−0.7308742	−0.7354955	+1579	−0.3170536	−0.3190581	+501
17	0.5709668	0.5637811	2278	0.7400605	0.7445688	1547	0.3210382	0.3229937	484
18	0.5565518	0.5492794	2311	0.7490199	0.7534136	1515	0.3249243	0.3268299	467
19	0.5419646	0.5346079	2344	0.7577494	0.7620269	1482	0.3287104	0.3305656	449
20	0.5272098	0.5197710	2376	0.7662458	0.7704056	1448	0.3323953	0.3341994	431
21	−0.5122920	−0.5047733	−2408	−0.7745060	−0.7785466	+1414	−0.3359778	−0.3377302	+413
22	0.4972156	0.4896195	2439	0.7825271	0.7864472	1379	0.3394565	0.3411566	394
23	0.4819856	0.4743146	2470	0.7903064	0.7941045	1344	0.3428303	0.3444775	375
24	0.4666070	0.4588634	2501	0.7978411	0.8015160	1308	0.3460981	0.3476918	356
25	0.4510846	0.4432712	2531	0.8051288	0.8086793	1271	0.3492587	0.3507986	337
26	−0.4354238	−0.4275427	−2560	−0.8121672	−0.8155920	+1234	−0.3523114	−0.3537968	+318
27	0.4196289	0.4116832	2588	0.8189535	0.8222517	1196	0.3552548	0.3566854	299
28	0.4037060	0.3956980	2616	0.8254862	0.8286568	1158	0.3580883	0.3594635	280
29	0.3876599	0.3795922	2643	0.8317632	0.8348051	1119	0.3608109	0.3621305	260
30	0.3714956	0.3633708	2669	0.8377825	0.8406952	1079	0.3634222	0.3646858	240
Dec. 1	−0.3552183	−0.3470388	−2694	−0.8435430	−0.8463255	+1039	−0.3659213	−0.3671284	+220
2	0.3388330	0.3306014	2719	0.8490426	0.8516943	998	0.3683072	0.3694578	199
3	0.3223447	0.3140633	2743	0.8542803	0.8568005	957	0.3705799	0.3716735	179
4	0.3057580	0.2974294	2767	0.8592546	0.8616426	915	0.3727383	0.3737744	158
5	0.2890782	0.2807048	2790	0.8639642	0.8662193	873	0.3747818	0.3757604	138
6	−0.2723099	−0.2638939	−2813	−0.8684077	−0.8705294	+ 831	−0.3767101	−0.3776307	+117
7	0.2554576	0.2470015	2834	0.8725840	0.8745714	788	0.3785222	0.3793847	96
8	0.2385263	0.2300325	2855	0.8764914	0.8783440	745	0.3802179	0.3810218	75
9	0.2215208	0.2129917	2875	0.8801290	0.8818460	701	0.3817962	0.3825412	54
10	0.2044458	0.1958837	2894	0.8834950	0.8850758	656	0.3832567	0.3839426	33
11	−0.1873062	−0.1787140	−2912	−0.8865883	−0.8880321	+ 610	−0.3845987	−0.3852250	+ 12
12	0.1701076	0.1614875	2929	0.8894073	0.8907137	564	0.3858215	0.3863881	− 9
13	0.1528545	0.1442094	2945	0.8919512	0.8931195	518	0.3869248	0.3874315	30
14	0.1355527	0.1268852	2961	0.8942186	0.8952482	471	0.3879081	0.3883546	52
15	0.1182074	0.1095200	2976	0.8962082	0.8970986	424	0.3887708	0.3891568	73
16	−0.1008237	−0.0921193	−2990	−0.8979193	−0.8986702	+ 377	−0.3895125	−0.3898379	− 95
17	0.0834074	0.0746887	3003	0.8993511	0.8999620	329	0.3901329	0.3903976	117
18	0.0659640	0.0572338	3016	0.9005028	0.9009733	281	0.3906318	0.3908356	139
19	0.0484990	0.0397601	3028	0.9013735	0.9017034	233	0.3910088	0.3911515	161
20	0.0310180	0.0222734	3038	0.9019629	0.9021519	184	0.3912637	0.3913453	183
21	−0.0135270	−0.0047794	−3048	−0.9022704	−0.9023184	+ 135	−0.3913964	−0.3914168	−205
22	+0.0039685	+0.0127160	3056	0.9022958	0.9022027	85	0.3914067	0.3913661	227
23	0.0214625	0.0302072	3064	0.9020391	0.9018049	+ 35	0.3912949	0.3911930	248
24	0.0389494	0.0476882	3070	0.9015002	0.9011250	− 15	0.3910606	0.3908977	270
25	0.0564230	0.0651532	3075	0.9006795	0.9001636	66	0.3907043	0.3904804	292
26	+0.0738780	+0.0825967	−3080	−0.8995774	−0.8989210	− 117	−0.3902261	−0.3899413	−314
27	0.0913085	0.1000127	3084	0.8981945	0.8973980	168	0.3896262	0.3892808	336
28	0.1087086	0.1173957	3086	0.8965316	0.8955955	219	0.3889051	0.3884992	358
29	0.1260733	0.1347406	3087	0.8945897	0.8935142	270	0.3880631	0.3875969	380
30	0.1433971	0.1520420	3088	0.8923693	0.8911552	322	0.3871006	0.3865742	402
31	+0.1606746	+0.1692943	−3088	−0.8898719	−0.8885196	− 374	−0.3860178	−0.3854314	−424
32	+0.1779010	+0.1864933	−3088	−0.8870986	−0.8856088	− 426	−0.3848152	−0.3841693	−446

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		Day of Month.	FEBRUARY.		Day of Month.	MARCH.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	279 37 0.1	+1 44 39.7	1.0	332 39 54.3	+4 53 36.1	1.0	340 49 18.9	+4 58 50.5
1.5	286 53 9.7	2 21 27.8	1.5	340 14 59.1	5 2 13.6	1.5	348 30 16.4	4 59 52.4
2.0	294 12 40.6	2 56 11.5	2.0	347 47 36.7	5 5 32.1	2.0	356 9 48.5	4 55 30.1
2.5	301 34 39.1	3 28 9.6	2.5	355 16 37.7	5 3 34.3	2.5	3 46 28.1	4 45 53.5
3.0	308 58 8.0	3 56 43.9	3.0	2 41 2.6	4 56 30.9	3.0	11 18 56.6	4 31 21.2
3.5	316 22 8.6	+4 21 21.3	3.5	10 0 4.0	+4 44 40.2	3.5	18 46 6.4	+4 12 19.1
4.0	323 45 43.0	4 41 34.6	4.0	17 13 6.9	4 28 25.1	4.0	26 7 3.8	3 49 18.6
4.5	331 7 56.6	4 57 3.6	4.5	24 19 49.1	4 8 13.0	4.5	33 21 9.5	3 22 55.0
5.0	338 27 59.7	5 7 35.5	5.0	31 20 0.6	3 44 33.6	5.0	40 27 59.1	2 53 45.0
5.5	345 45 8.9	5 13 4.5	5.5	38 13 41.2	3 17 58.0	5.5	47 27 21.9	2 22 25.3
6.0	352 58 48.2	+5 13 31.9	6.0	45 1 0.4	+2 48 57.3	6.0	54 19 19.3	+1 49 32.0
6.5	0 8 29.8	5 9 5.0	6.5	51 42 14.1	2 18 2.0	6.5	61 4 3.3	1 15 38.6
7.0	7 13 53.8	4 59 56.5	7.0	58 17 44.0	1 45 41.7	7.0	67 41 54.5	0 41 16.4
7.5	14 14 47.8	4 46 23.5	7.5	64 47 55.5	1 12 24.8	7.5	74 13 19.5	+0 6 54.0
8.0	21 11 6.1	4 28 46.7	8.0	71 13 16.0	0 38 37.8	8.0	80 38 49.5	−0 27 2.9
8.5	28 2 49.0	+4 7 29.2	8.5	77 34 14.1	+0 4 46.1	8.5	86 58 58.7	−1 0 11.1
9.0	34 50 1.6	3 42 56.0	9.0	83 51 18.1	−0 28 46.7	9.0	93 14 22.5	1 32 10.1
9.5	41 32 52.6	3 15 33.7	9.5	90 4 55.9	1 1 38.4	9.5	99 25 37.0	2 2 41.2
10.0	48 11 33.2	2 45 49.4	10.0	96 15 33.3	1 33 28.2	10.0	105 33 17.2	2 31 27.8
10.5	54 46 16.3	2 14 10.7	10.5	102 23 34.5	2 3 56.7	10.5	111 37 57.0	2 58 15.0
11.0	61 17 15.8	+1 41 5.2	11.0	108 29 21.1	−2 32 45.8	11.0	117 40 7.9	−3 22 49.1
11.5	67 44 45.6	1 7 0.4	11.5	114 33 12.5	2 59 38.9	11.5	123 40 19.7	3 44 58.2
12.0	74 8 59.2	+0 32 23.2	12.0	120 35 25.9	3 24 20.7	12.0	129 38 58.8	4 4 31.1
12.5	80 30 9.0	−0 2 20.0	12.5	126 36 15.9	3 46 37.3	12.5	135 36 29.3	4 21 18.3
13.0	86 48 26.6	0 36 43.9	13.0	132 35 55.4	4 6 16.4	13.0	141 33 12.4	4 35 11.2
13.5	93 4 2.7	−1 10 24.3	13.5	138 34 35.8	−4 23 7.4	13.5	147 29 26.3	−4 46 2.6
14.0	99 17 6.9	1 42 58.3	14.0	144 32 27.3	4 37 1.2	14.0	153 25 26.9	4 53 46.6
14.5	105 27 47.6	2 14 4.5	14.5	150 29 39.2	4 47 50.6	14.5	159 21 28.2	4 58 18.8
15.0	111 36 13.0	2 43 23.3	15.0	156 26 20.7	4 55 30.0	15.0	165 17 41.9	4 59 36.4
15.5	117 42 31.4	3 10 36.8	15.5	162 22 41.5	4 59 55.6	15.5	171 14 18.4	4 57 37.9
16.0	123 46 50.4	−3 35 29.4	16.0	168 18 51.9	−5 1 5.3	16.0	177 11 27.4	−4 52 23.9
16.5	129 49 18.9	3 57 47.1	16.5	174 15 3.5	4 58 58.6	16.5	183 9 17.9	4 43 56.3
17.0	135 50 6.4	4 17 18.2	17.0	180 11 29.7	4 53 36.7	17.0	189 7 59.2	4 32 19.1
17.5	141 49 23.8	4 33 52.9	17.5	186 8 25.9	4 45 2.1	17.5	195 7 40.9	4 17 38.0
18.0	147 47 23.5	4 47 23.5	18.0	192 6 10.0	4 33 19.1	18.0	201 8 34.1	4 0 0.2
18.5	153 44 20.5	−4 57 43.8	18.5	198 5 2.4	−4 18 32.9	18.5	207 10 51.2	−3 39 35.0
19.0	159 40 31.2	5 4 49.6	19.0	204 5 26.5	4 0 50.3	19.0	213 14 46.5	3 16 33.0
19.5	165 36 15.3	5 8 37.8	19.5	210 7 48.1	3 40 19.2	19.5	219 20 36.6	2 51 6.6
20.0	171 31 53.9	5 9 7.1	20.0	216 12 36.0	3 17 9.1	20.0	225 28 40.4	2 23 29.7
20.5	177 27 51.8	5 6 17.2	20.5	222 20 21.1	2 51 30.3	20.5	231 39 19.3	1 53 57.8
21.0	183 24 35.9	−5 0 8.9	21.0	228 31 36.5	−2 23 35.1	21.0	237 52 57.0	−1 22 47.9
21.5	189 22 35.6	4 50 44.0	21.5	234 46 56.8	1 53 37.5	21.5	244 9 59.4	0 50 18.6
22.0	195 22 22.5	4 38 5.3	22.0	241 6 57.1	1 21 53.5	22.0	250 30 53.9	−0 16 50.2
22.5	201 24 30.1	4 22 16.7	22.5	247 32 12.4	0 48 41.0	22.5	256 56 8.9	+0 17 15.1
23.0	207 29 33.6	4 3 23.1	23.0	254 3 16.8	−0 14 20.7	23.0	263 26 13.3	0 51 33.5
23.5	213 38 8.8	−3 41 30.9	23.5	260 40 41.4	+0 20 43.7	23.5	270 1 34.9	+1 25 39.0
24.0	219 50 52.8	3 16 48.1	24.0	267 24 53.3	0 56 5.2	24.0	276 42 39.5	1 59 3.8
24.5	226 8 21.4	2 49 24.4	24.5	274 16 13.3	1 31 14.2	24.5	283 29 49.4	2 31 18.0
25.0	232 31 9.5	2 19 32.0	25.0	281 14 54.3	2 5 37.2	25.0	290 23 21.9	3 1 50.1
25.5	238 59 49.6	1 47 25.9	25.5	288 20 59.8	2 38 38.2	25.5	297 23 26.9	3 30 7.3
26.0	245 34 50.8	−1 13 24.3	26.0	295 34 20.6	+3 9 38.7	26.0	304 30 5.8	+3 55 35.9
26.5	252 16 36.9	0 37 49.0	26.5	302 54 34.2	3 37 59.4	26.5	311 43 9.3	4 17 42.4
27.0	259 5 24.9	−0 1 6.1	27.0	310 21 3.9	4 3 1.1	27.0	319 2 16.4	4 35 54.8
27.5	266 1 23.7	+0 36 14.0	27.5	317 52 58.1	4 24 6.8	27.5	326 26 52.8	4 49 44.0
28.0	273 4 32.2	1 13 37.0	28.0	325 29 11.5	4 40 43.4	28.0	333 56 11.6	4 58 45.1
28.5	280 14 37.7	+1 50 24.4	28.5	333 8 27.4	+4 52 24.3	28.5	341 29 13.1	+5 2 39.4
29.0	287 31 15.7	2 25 55.0	29.0	340 49 18.9	4 58 50.5	29.0	349 4 47.3	5 1 15.9
29.5	294 53 48.4	2 59 25.7	29.5	348 30 16.4	4 59 52.4	29.5	356 41 36.4	4 54 31.9
30.0	302 21 25.6	3 30 13.3	30.0	356 9 48.5	4 55 30.1	30.0	4 18 17.6	4 42 34.3
30.5	309 53 5.3	3 57 36.5	30.5	3 46 28.1	4 45 53.5	30.5	11 53 27.5	4 25 39.0
31.0	317 27 36.0	+4 20 57.8	31.0	11 18 56.6	+4 31 21.2	31.0	19 25 46.3	+4 4 10.1
31.5	325 3 39.6	+4 39 45.7	31.5	18 46 6.4	+4 12 19.1	31.5	26 54 0.8	+3 38 38.7

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL. True Longitude.	APRIL. Latitude.	Day of Month.	MAY. True Longitude.	MAY. Latitude.	Day of Month.	JUNE. True Longitude.	JUNE. Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	34 17 7.5	+3 9 41.4	1.0	70 43 20.2	+0 2 30.8	1.0	118 2 24.8	−3 52 24.6
1.5	41 34 14.9	2 37 57.7	1.5	77 32 39.9	−0 34 46.5	1.5	124 17 41.4	4 14 29.7
2.0	48 44 44.6	2 4 8.6	2.0	84 15 40.6	1 11 1.8	2.0	130 28 55.9	4 33 21.4
2.5	55 48 11.5	1 28 54.5	2.5	90 52 27.1	1 45 46.9	2.5	136 36 32.8	4 48 53.7
3.0	62 44 23.2	0 52 54.0	3.0	97 23 11.9	2 18 38.2	3.0	142 40 59.6	5 1 2.9
3.5	69 33 18.9	+0 16 42.9	3.5	103 48 13.7	−2 49 15.7	3.5	148 42 46.1	−5 9 46.7
4.0	76 15 8.1	−0 19 6.7	4.0	110 7 56.0	3 17 22.8	4.0	154 42 24.1	5 15 4.5
4.5	82 50 8.6	0 54 6.2	4.5	116 22 46.7	3 42 46.5	4.5	160 40 26.7	5 16 56.8
5.0	89 18 45.2	1 27 50.6	5.0	122 33 16.7	4 5 16.3	5.0	166 37 28.1	5 15 24.6
5.5	95 41 27.6	1 59 58.7	5.5	128 39 59.5	4 24 44.1	5.5	172 34 2.5	5 10 30.1
6.0	101 58 49.4	−2 30 12.3	6.0	134 43 29.5	−4 41 3.5	6.0	178 30 44.4	−5 2 16.1
6.5	108 11 25.9	2 58 15.8	6.5	140 44 21.7	4 54 9.8	6.5	184 28 8.1	4 50 46.2
7.0	114 19 54.1	3 23 56.0	7.0	146 43 11.5	5 3 59.3	7.0	190 26 46.7	4 36 5.2
7.5	120 24 51.1	3 47 1.8	7.5	152 40 33.6	5 10 29.7	7.5	196 27 12.0	4 18 18.4
8.0	126 26 53.2	4 7 23.7	8.0	158 37 2.0	5 13 39.3	8.0	202 29 54.2	3 57 33.0
8.5	132 26 35.5	−4 24 53.5	8.5	164 33 9.2	−5 13 27.4	8.5	208 35 21.5	−3 33 57.5
9.0	138 24 31.7	4 39 24.3	9.0	170 29 25.8	5 9 54.0	9.0	214 43 59.3	3 7 42.2
9.5	144 21 13.3	4 50 50.2	9.5	176 26 21.0	5 3 0.3	9.5	220 56 10.3	2 38 59.7
10.0	150 17 9.2	4 59 6.4	10.0	182 24 21.2	4 52 48.6	10.0	227 12 13.8	2 8 5.0
10.5	156 12 46.0	5 4 9.0	10.5	188 23 50.8	4 39 22.2	10.5	233 32 25.3	1 35 16.0
11.0	162 8 27.7	−5 5 55.1	11.0	194 25 11.7	−4 22 46.2	11.0	239 56 56.4	−1 0 53.1
11.5	168 4 35.3	5 4 23.2	11.5	200 28 43.1	4 3 7.3	11.5	246 25 54.3	−0 25 20.0
12.0	174 1 27.6	4 59 33.2	12.0	206 34 41.4	3 40 34.1	12.0	252 59 21.9	+0 10 57.1
12.5	179 59 20.7	4 51 26.1	12.5	212 43 20.7	3 15 17.4	12.5	259 37 17.4	0 47 29.3
13.0	185 58 28.5	4 40 4.9	13.0	218 54 52.6	2 47 30.5	13.0	266 19 34.4	1 23 45.2
13.5	191 59 3.2	−4 25 34.0	13.5	225 9 26.2	−2 17 28.8	13.5	273 6 2.2	+1 59 11.9
14.0	198 1 15.1	4 8 0.0	14.0	231 27 8.5	1 45 30.5	14.0	279 56 25.9	2 33 15.7
14.5	204 5 13.7	3 47 31.3	14.5	237 48 4.6	1 11 56.2	14.5	286 50 27.1	3 5 22.5
15.0	210 11 7.3	3 24 18.5	15.0	244 12 17.6	0 37 9.0	15.0	293 47 44.1	3 34 59.0
15.5	216 19 4.2	2 58 34.2	15.5	250 39 49.6	−0 1 34.1	15.5	300 47 52.8	4 1 33.9
16.0	222 29 12.6	−2 30 33.0	16.0	257 10 41.5	+0 34 21.4	16.0	307 50 27.2	+4 24 38.3
16.5	228 41 41.3	2 0 31.7	16.5	263 44 53.0	1 10 8.8	16.5	314 55 0.3	4 43 47.0
17.0	234 56 39.8	1 28 49.1	17.0	270 22 23.1	1 45 18.1	17.0	322 1 4.9	4 58 38.7
17.5	241 14 18.5	0 55 45.5	17.5	277 3 10.4	2 19 19.1	17.5	329 8 14.2	5 8 57.0
18.0	247 34 49.5	−0 21 43.1	18.0	283 47 13.0	2 51 41.1	18.0	336 16 2.2	5 14 30.6
18.5	253 58 26.1	+0 12 54.5	18.5	290 34 28.3	+3 21 53.8	18.5	343 24 4.5	+5 15 13.5
19.0	260 25 22.6	0 47 42.1	19.0	297 24 53.0	3 49 27.9	19.0	350 31 58.2	5 11 5.0
19.5	266 55 54.3	1 22 13.2	19.5	304 18 22.9	4 13 55.6	19.5	357 39 22.5	5 2 9.8
20.0	273 30 17.0	1 56 0.6	20.0	311 14 52.5	4 34 51.2	20.0	4 45 58.1	4 48 37.5
20.5	280 8 46.7	2 28 36.2	20.5	318 14 14.6	4 51 51.5	20.5	11 51 27.6	4 30 42.6
21.0	286 51 38.2	+2 59 31.1	21.0	325 16 20.0	+5 4 36.3	21.0	18 55 35.2	+4 8 44.0
21.5	293 39 4.3	3 28 15.9	21.5	332 20 57.0	5 12 49.1	21.5	25 58 6.1	3 43 4.6
22.0	300 31 15.4	3 54 21.5	22.0	339 27 50.9	5 16 17.7	22.0	32 58 46.3	3 14 10.7
22.5	307 28 17.5	4 17 19.2	22.5	346 36 43.6	5 14 54.5	22.5	39 57 22.9	2 42 31.6
23.0	314 30 11.0	4 36 41.4	23.0	353 47 13.8	5 8 37.0	23.0	46 53 42.9	2 8 38.8
23.5	321 36 50.0	+4 52 2.4	23.5	0 58 56.6	+4 57 28.4	23.5	53 47 33.9	+1 33 5.5
24.0	328 48 1.2	5 2 59.4	24.0	8 11 23.3	4 41 37.3	24.0	60 38 43.6	0 56 26.0
24.5	336 3 22.8	5 9 13.1	24.5	15 24 2.4	4 21 18.5	24.5	67 27 0.0	+0 19 14.3
25.0	343 22 24.0	5 10 29.2	25.0	22 36 19.9	3 56 52.1	25.0	74 12 11.4	−0 17 55.5
25.5	350 44 25.4	5 6 39.5	25.5	29 47 40.2	3 28 44.0	25.5	80 54 7.0	0 54 31.1
26.0	358 8 39.7	+4 57 42.3	26.0	36 57 26.6	+2 57 24.4	26.0	87 32 37.1	−1 30 1.7
26.5	5 34 12.5	4 43 43.7	26.5	44 5 2.6	2 23 27.3	26.5	94 7 33.3	2 3 59.3
27.0	13 0 4.5	4 24 57.1	27.0	51 9 53.1	1 47 29.5	27.0	100 38 49.1	2 35 58.4
27.5	20 25 14.0	4 1 43.6	27.5	58 11 25.3	1 10 9.5	27.5	107 6 20.3	3 5 36.9
28.0	27 48 38.4	3 34 31.2	28.0	65 9 9.9	+0 32 5.8	28.0	113 30 5.6	3 32 36.0
28.5	35 9 17.8	+3 3 53.5	28.5	72 2 41.6	−0 6 3.7	28.5	119 50 6.4	−3 56 40.3
29.0	42 26 16.8	2 30 28.6	29.0	78 51 40.2	0 43 43.2	29.0	126 6 27.6	4 17 37.7
29.5	49 38 46.5	1 54 56.8	29.5	85 35 50.5	1 20 19.4	29.5	132 19 17.2	4 35 19.0
30.0	56 46 6.4	1 17 59.7	30.0	92 15 3.0	1 55 22.7	30.0	138 28 47.0	4 49 38.0
30.5	63 47 44.9	0 40 18.1	30.5	98 49 14.1	2 28 27.0	30.5	144 35 12.3	5 0 31.0
31.0	70 43 20.2	+0 2 30.8	31.0	105 18 25.8	−2 59 10.3	31.0	150 38 51.5	−5 7 56.2
31.5	77 32 39.9	−0 34 46.5	31.5	111 42 45.3	−3 27 14.4	31.5	156 40 6.7	−5 11 53.7

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		Day of Month.	AUGUST.		Day of Month.	SEPTEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	150 38 51.5	−5 7 56.2	1.0	194 33 28.4	−4 8 12.5	1.0	239 3 54.2	−0 36 45.0
1.5	156 40 6.7	5 11 53.7	1.5	200 29 23.0	3 48 32.1	1.5	245 14 37.8	−0 4 7.3
2.0	162 39 22.6	5 12 25.2	2.0	206 26 28.3	3 26 18.5	2.0	251 30 5.5	+0 28 58.6
2.5	168 37 7.0	5 9 33.5	2.5	212 25 20.5	3 1 42.3	2.5	257 50 55.5	1 2 11.1
3.0	174 33 49.6	5 3 22.6	3.0	218 26 37.5	2 34 54.8	3.0	264 17 44.0	1 35 6.7
3.5	180 30 2.8	−4 53 56.9	3.5	224 30 57.7	−2 6 8.7	3.5	270 51 4.0	+2 7 19.4
4.0	186 26 20.4	4 41 22.2	4.0	230 39 0.1	1 35 38.3	4.0	277 31 23.3	2 38 21.2
4.5	192 23 17.6	4 25 44.3	4.5	236 51 23.1	1 3 39.0	4.5	284 19 3.1	3 7 41.7
5.0	198 21 30.3	4 7 10.4	5.0	243 8 43.7	−0 30 28.8	5.0	291 14 16.0	3 34 48.8
5.5	204 21 35.1	3 45 48.4	5.5	249 31 36.4	+0 3 31.9	5.5	298 17 4.1	3 59 9.1
6.0	210 24 7.9	−3 21 47.2	6.0	256 0 31.9	+0 38 0.6	6.0	305 27 17.2	+4 20 9.1
6.5	216 29 44.4	2 55 17.3	6.5	262 35 56.0	1 12 31.3	6.5	312 44 31.8	4 37 16.3
7.0	222 38 58.6	2 26 30.8	7.0	269 18 8.1	1 46 35.2	7.0	320 8 10.0	4 50 0.9
7.5	228 52 22.5	1 55 41.8	7.5	276 7 19.4	2 19 41.1	7.5	327 37 20.2	4 57 57.8
8.0	235 10 25.4	1 23 6.6	8.0	283 3 31.6	2 51 15.1	8.0	335 10 58.0	5 0 47.9
8.5	241 33 32.9	−0 49 4.3	8.5	290 6 35.6	+3 20 41.7	8.5	342 47 47.9	+4 58 19.8
9.0	248 2 5.6	−0 13 57.1	9.0	297 16 10.8	3 47 24.6	9.0	350 26 27.5	4 50 31.2
9.5	254 36 18.8	+0 21 50.1	9.5	304 31 44.7	4 10 48.1	9.5	358 5 29.9	4 37 29.4
10.0	261 16 21.4	0 57 49.0	10.0	311 52 32.6	4 30 19.0	10.0	5 43 29.5	4 19 30.8
10.5	268 2 15.1	1 33 28.4	10.5	319 17 39.4	4 45 27.8	10.5	13 19 4.6	3 57 0.4
11.0	274 53 53.7	+2 8 14.8	11.0	326 46 0.8	+4 55 50.6	11.0	20 51 1.9	+3 30 30.2
11.5	281 51 3.0	2 41 32.7	11.5	334 16 26.2	5 1 10.3	11.5	28 18 18.5	3 0 37.5
12.0	288 53 20.1	3 12 45.9	12.0	341 47 41.8	5 1 18.1	12.0	35 40 4.5	2 28 2.6
12.5	296 0 14.4	3 41 18.6	12.5	349 18 33.9	4 56 13.4	12.5	42 55 43.2	1 53 27.0
13.0	303 11 7.7	4 6 36.3	13.0	356 47 52.0	4 46 4.3	13.0	50 4 51.2	1 17 32.0
13.5	310 25 16.0	+4 28 7.5	13.5	4 14 32.2	+4 31 6.5	13.5	57 7 17.4	+0 40 56.8
14.0	317 41 50.4	4 45 25.2	14.0	11 37 39.2	4 11 42.4	14.0	64 3 1.3	+0 4 17.9
14.5	324 59 59.6	4 58 7.5	14.5	18 56 28.2	3 48 20.0	14.5	70 52 11.7	−0 31 51.3
15.0	332 18 51.4	5 5 59.2	15.0	26 10 25.5	3 21 31.0	15.0	77 35 4.7	1 7 1.2
15.5	339 37 35.0	5 8 51.6	15.5	33 19 8.1	2 51 49.6	15.5	84 12 1.5	1 40 45.8
16.0	346 55 22.9	+5 6 42.9	16.0	40 22 23.7	+2 19 51.0	16.0	90 43 27.3	−2 12 42.5
16.5	354 11 32.6	4 59 38.1	16.5	47 20 8.9	1 46 10.5	16.5	97 9 49.9	2 42 31.8
17.0	1 25 27.3	4 47 48.7	17.0	54 12 28.2	1 11 22.3	17.0	103 31 37.4	3 9 57.0
17.5	8 36 37.0	4 31 31.2	17.5	60 59 32.3	0 35 59.4	17.5	109 49 18.4	3 34 44.2
18.0	15 44 38.8	4 11 6.9	18.0	67 41 36.3	+0 0 32.7	18.0	116 3 20.7	3 56 41.6
18.5	22 49 16.2	+3 47 0.9	18.5	74 18 58.5	−0 34 29.0	18.5	122 14 10.6	−4 15 39.5
19.0	29 50 18.9	3 19 41.0	19.0	80 51 58.5	1 8 38.9	19.0	128 22 12.4	4 31 30.2
19.5	36 47 42.1	2 49 37.0	19.5	87 20 57.2	1 41 32.5	19.5	134 27 48.6	4 44 7.7
20.0	43 41 25.2	2 17 20.0	20.0	93 46 14.7	2 12 47.9	20.0	140 31 19.3	4 53 27.8
20.5	50 31 30.8	1 43 21.6	20.5	100 8 10.1	2 42 4.9	20.5	146 33 2.4	4 59 27.6
21.0	57 18 3.9	+1 8 13.7	21.0	106 27 1.3	−3 9 5.6	21.0	152 33 13.6	−5 2 6.3
21.5	64 1 10.9	+0 32 27.5	21.5	112 43 4.0	3 33 34.4	21.5	158 32 7.0	5 1 24.4
22.0	70 40 58.8	−0 3 26.2	22.0	118 56 32.1	3 55 17.7	22.0	164 29 55.0	4 57 24.2
22.5	77 17 34.3	0 38 58.0	22.5	125 7 37.3	4 14 4.1	22.5	170 26 48.9	4 50 9.6
23.0	83 51 3.7	1 13 39.8	23.0	131 16 29.7	4 29 44.3	23.0	176 22 59.7	4 39 46.1
23.5	90 21 32.1	−1 47 5.3	23.5	137 23 18.4	−4 42 11.2	23.5	182 18 37.8	−4 26 20.7
24.0	96 49 3.9	2 18 50.2	24.0	143 28 10.9	4 51 20.0	24.0	188 13 54.3	4 10 2.1
24.5	103 13 42.3	2 48 32.5	24.5	149 31 14.5	4 57 7.8	24.5	194 9 0.7	3 51 0.1
25.0	109 35 30.1	3 15 52.5	25.0	155 32 36.7	4 59 33.8	25.0	200 4 10.1	3 29 26.2
25.5	115 54 29.3	3 40 33.1	25.5	161 32 24.9	4 58 39.2	25.5	205 59 37.0	3 5 33.0
26.0	122 10 41.9	−4 2 20.3	26.0	167 30 47.9	−4 54 27.0	26.0	211 55 37.9	−2 39 34.2
26.5	128 24 10.7	4 21 2.5	26.5	173 27 56.2	4 47 2.0	26.5	217 52 31.1	2 11 44.5
27.0	134 34 59.0	4 36 30.7	27.0	179 24 1.9	4 36 30.4	27.0	223 50 38.2	1 42 19.5
27.5	140 43 11.6	4 48 38.9	27.5	185 19 19.6	4 22 59.8	27.5	229 50 22.6	1 11 36.0
28.0	146 48 55.6	4 57 23.3	28.0	191 14 6.5	4 6 39.1	28.0	235 52 10.4	0 39 51.4
28.5	152 52 19.8	−5 2 42.4	28.5	197 8 42.5	−3 47 38.1	28.5	241 56 30.1	−0 7 24.2
29.0	158 53 36.2	5 4 36.8	29.0	203 3 30.6	3 26 7.6	29.0	248 3 52.5	+0 25 26.2
29.5	164 52 58.9	5 3 8.8	29.5	208 58 56.6	3 2 19.6	29.5	254 14 50.0	0 58 19.4
30.0	170 50 45.6	4 58 22.4	30.0	214 55 29.4	2 36 26.6	30.0	260 29 56.1	1 30 53.8
30.5	176 47 16.6	4 50 22.8	30.5	220 53 40.5	2 8 41.8	30.5	266 49 44.9	2 2 46.5
31.0	182 42 55.9	−4 39 16.3	31.0	226 54 3.9	−1 39 19.5	31.0	273 14 50.2	+2 33 33.5
31.5	188 38 10.1	−4 25 10.2	31.5	232 57 15.9	−1 8 35.0	31.5	279 45 43.8	+3 2 49.1

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.		Day of Month.	NOVEMBER.		Day of Month.	DECEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
1.0	273 14 50.2	+2 33 33.5	1.0	323 26 57.2	+5 11 30.2	1.0	2 10 30.7	+4 34 0.0
1.5	279 45 43.8	3 2 49.1	1.5	330 31 50.9	5 14 52.8	1.5	9 23 7.7	4 11 44.8
2.0	286 22 55.0	3 30 6.4	2.0	337 42 20.1	5 13 25.7	2.0	16 37 58.0	3 45 21.6
2.5	293 6 48.7	3 54 57.3	2.5	344 58 4.4	5 6 58.0	2.5	23 54 30.5	3 15 14.1
3.0	299 57 43.2	4 16 53.0	3.0	352 18 33.9	4 55 26.3	3.0	31 12 10.0	2 41 51.6
3.5	306 55 49.5	+4 35 24.6	3.5	359 43 8.5	+4 38 53.4	3.5	38 30 16.6	+2 5 48.4
4.0	314 1 8.3	4 50 3.7	4.0	7 10 59.2	4 17 29.6	4.0	45 48 7.3	1 27 43.1
4.5	321 13 29.6	5 0 23.6	4.5	14 41 8.9	3 51 33.6	4.5	53 4 57.5	0 48 17.4
5.0	328 32 30.2	5 6 0.8	5.0	22 12 34.0	3 21 32.2	5.0	60 20 1.2	+0 8 14.8
5.5	335 57 33.4	5 6 36.6	5.5	29 44 7.1	2 47 58.9	5.5	67 32 33.3	−0 31 41.1
6.0	343 27 49.6	+5 1 58.5	6.0	37 14 39.4	+2 11 33.9	6.0	74 41 51.3	−1 10 48.0
6.5	351 2 16.6	4 52 2.1	6.5	44 43 3.4	1 33 1.8	6.5	81 47 15.7	1 48 26.5
7.0	358 39 42.0	4 36 51.1	7.0	52 8 15.8	0 53 9.5	7.0	88 48 12.2	2 24 1.3
7.5	6 18 45.4	4 16 39.1	7.5	59 29 19.2	+0 12 44.6	7.5	95 44 11.9	2 57 1.4
8.0	13 58 3.0	3 51 48.6	8.0	66 45 24.5	−0 27 27.0	8.0	102 34 53.2	3 27 1.5
8.5	21 36 10.3	+3 22 50.9	8.5	73 55 52.0	−1 6 42.3	8.5	109 20 1.0	−3 53 41.8
9.0	29 11 46.5	2 50 24.2	9.0	81 0 11.7	1 44 23.0	9.0	115 59 27.5	4 16 47.5
9.5	36 43 38.1	2 15 11.9	9.5	87 58 4.0	2 19 55.9	9.5	122 33 12.2	4 36 8.8
10.0	44 10 41.0	1 37 59.6	10.0	94 49 19.2	2 52 53.6	10.0	129 1 21.3	4 51 40.4
10.5	51 32 3.3	0 59 34.3	10.5	101 33 56.6	3 22 54.0	10.5	135 24 7.2	5 3 20.6
11.0	58 47 5.2	+0 20 41.0	11.0	108 12 3.5	−3 49 40.6	11.0	141 41 48.1	−5 11 10.9
11.5	65 55 20.4	−0 17 58.0	11.5	114 43 54.6	4 13 1.4	11.5	147 54 47.1	5 15 14.9
12.0	72 56 34.6	0 55 44.6	12.0	121 9 50.0	4 32 48.4	12.0	154 3 31.1	5 15 38.1
12.5	79 50 44.0	1 32 5.3	12.5	127 30 15.3	4 48 57.1	12.5	160 8 30.6	5 12 27.6
13.0	86 37 55.5	2 6 31.8	13.0	133 45 39.0	5 1 25.7	13.0	166 10 18.7	5 5 51.1
13.5	93 18 23.6	−2 38 40.3	13.5	139 56 32.6	−5 10 14.6	13.5	172 9 30.5	−4 55 57.4
14.0	99 52 29.1	3 8 11.7	14.0	146 3 29.2	5 15 25.9	14.0	178 6 42.3	4 42 55.4
14.5	106 20 37.4	3 34 51.0	14.5	152 7 3.1	5 17 3.0	14.5	184 2 31.2	4 26 54.7
15.0	112 43 17.5	3 58 26.4	15.0	158 7 48.6	5 15 10.3	15.0	189 57 34.0	4 8 5.4
15.5	119 1 0.8	4 18 49.4	15.5	164 6 19.9	5 9 53.0	15.5	195 52 27.9	3 46 38.1
16.0	125 14 19.1	−4 35 53.6	16.0	170 3 10.4	−5 1 17.4	16.0	201 47 48.9	−3 22 43.9
16.5	131 23 44.8	4 49 34.7	16.5	175 58 52.3	4 49 30.0	16.5	207 44 11.5	2 56 35.0
17.0	137 29 49.7	4 59 50.3	17.0	181 53 56.4	4 34 38.7	17.0	213 42 8.8	2 28 24.4
17.5	143 33 4.7	5 6 39.5	17.5	187 48 51.6	4 16 51.9	17.5	219 42 11.5	1 58 26.7
18.0	149 33 58.9	5 10 2.6	18.0	193 44 4.9	3 56 19.1	18.0	225 44 47.6	1 26 57.8
18.5	155 32 59.7	−5 10 1.0	18.5	199 40 1.3	−3 33 11.2	18.5	231 50 22.5	−0 54 15.3
19.0	161 30 32.5	5 6 37.3	19.0	205 37 3.4	3 7 40.2	19.0	237 59 18.1	−0 20 38.4
19.5	167 27 0.6	4 59 55.5	19.5	211 35 31.6	2 39 59.5	19.5	244 11 52.4	+0 13 31.3
20.0	173 22 45.3	4 50 0.7	20.0	217 35 44.5	2 10 24.2	20.0	250 28 19.8	0 47 50.7
20.5	179 18 5.8	4 36 59.2	20.5	223 37 58.1	1 39 11.0	20.5	256 48 50.2	1 21 54.6
21.0	185 13 19.4	−4 20 58.6	21.0	229 42 26.4	−1 6 38.4	21.0	263 13 29.3	+1 55 16.7
21.5	191 8 41.8	4 2 8.0	21.5	235 49 22.0	−0 33 6.4	21.5	269 42 18.4	2 27 29.3
22.0	197 4 27.6	3 40 38.2	22.0	241 58 55.3	+0 1 3.4	22.0	276 15 14.7	2 58 4.0
22.5	203 0 50.2	3 16 41.0	22.5	248 11 15.5	0 35 28.0	22.5	282 52 10.9	3 26 32.2
23.0	208 58 2.4	2 50 30.2	23.0	254 26 30.4	1 9 43.1	23.0	289 32 56.7	3 52 26.1
23.5	214 56 17.0	−2 22 20.6	23.5	260 44 47.3	+1 43 23.5	23.5	296 17 18.0	+4 15 19.3
24.0	220 55 46.7	1 52 28.7	24.0	267 6 11.8	2 16 3.6	24.0	303 4 58.5	4 34 46.9
24.5	226 56 44.5	1 21 12.0	24.5	273 30 49.7	2 47 17.2	24.5	309 55 39.8	4 50 27.1
25.0	232 59 24.6	0 48 49.6	25.0	279 58 46.1	3 16 38.2	25.0	316 49 3.1	5 2 1.4
25.5	239 4 1.7	−0 15 41.4	25.5	286 30 5.9	3 43 41.3	25.5	323 44 48.2	5 9 15.1
26.0	245 10 51.9	+0 17 51.6	26.0	293 4 53.7	+4 8 1.4	26.0	330 42 35.7	+5 11 57.7
26.5	251 20 13.1	0 51 27.6	26.5	299 43 13.9	4 29 15.2	26.5	337 42 7.1	5 10 3.3
27.0	257 32 24.2	1 24 44.1	27.0	306 25 10.1	4 47 0.5	27.0	344 43 5.1	5 3 30.8
27.5	263 47 45.6	1 57 17.6	27.5	313 10 45.7	5 0 57.3	27.5	351 45 13.7	4 52 23.6
28.0	270 6 38.8	2 28 44.6	28.0	320 0 2.6	5 10 48.1	28.0	358 48 18.4	4 36 49.9
28.5	276 29 26.2	+2 58 40.8	28.5	326 53 1.1	+5 16 17.7	28.5	5 52 6.2	+4 17 2.8
29.0	282 56 30.2	3 26 41.7	29.0	333 49 39.5	5 17 14.4	29.0	12 56 25.1	3 53 19.2
29.5	289 28 13.1	3 52 22.3	29.5	340 49 53.4	5 13 30.4	29.5	20 1 3.6	3 26 0.7
30.0	296 4 55.6	4 15 17.8	30.0	347 53 35.2	5 5 1.8	30.0	27 5 50.5	2 55 32.3
30.5	302 46 56.5	4 35 3.7	30.5	355 0 33.0	4 51 49.6	30.5	34 10 33.6	2 22 23.1
31.0	309 34 31.0	+4 51 15.9	31.0	2 10 30.7	+4 34 0.0	31.0	41 15 0.1	+1 47 4.6
31.5	316 27 49.7	+5 3 31.8	31.5	9 23 7.7	+4 11 44.8	31.5	48 18 55.3	+1 10 11.2

GREENWICH MEAN NOON.

Date.		MOON'S EQUATOR.				
		i Inclination to the Earth's Equator.	Δ Ascending Node on Earth's Equator to Ascending Node on Ecliptic.	Ω′ Ascending Node on Earth's Equator.	Ω Mean Longitude of Moon's Ascending Node. Daily Motion, −3′.177	☾ Moon's Mean Longitude.
		° ′	° ′	° ′	° ′	° ′
Jan.	0	23 46.3	75 52.4	3 36.4	259 10.8	270 26.7
	10	23 47.1	75 21.1	3 35.9	258 39.1	42 12.5
	20	23 47.9	74 49.8	3 35.3	258 7.3	173 58.4
	30	23 48.6	74 18.5	3 34.8	257 35.5	305 44.2
Feb.	9	23 49.4	73 47.2	3 34.3	257 3.8	77 30.0
	19	23 50.2	73 16.0	3 33.7	256 32.0	209 15.9
March	1	23 51.0	72 44.8	3 33.1	256 0.2	341 1.7
	11	23 51.8	72 13.6	3 32.5	255 28.4	112 47.5
	21	23 52.6	71 42.4	3 31.9	254 56.7	244 33.3
	31	23 53.4	71 11.2	3 31.3	254 24.9	16 19.2
April	10	23 54.1	70 40.0	3 30.6	253 53.1	148 5.0
	20	23 54.9	70 8.9	3 29.9	253 21.3	279 50.9
	30	23 55.6	69 37.8	3 29.2	252 49.6	51 36.7
May	10	23 56.4	69 6.7	3 28.5	252 17.8	183 22.6
	20	23 57.1	68 35.6	3 27.8	251 46.0	315 8.4
	30	23 57.9	68 4.5	3 27.0	251 14.3	86 54.3
June	9	23 58.6	67 33.5	3 26.2	250 42.5	218 40.1
	19	23 59.4	67 2.4	3 25.4	250 10.7	350 25.9
	29	24 0.2	66 31.4	3 24.6	249 38.9	122 11.8
July	9	24 0.9	66 0.3	3 23.8	249 7.2	253 57.6
	19	24 1.7	65 29.3	3 23.0	248 35.4	25 43.4
	29	24 2.4	64 58.4	3 22.1	248 3.6	157 29.3
Aug.	8	24 3.1	64 27.5	3 21.2	247 31.8	289 15.1
	18	24 3.9	63 56.6	3 20.4	247 0.1	61 1.0
	28	24 4.6	63 25.7	3 19.5	246 28.3	192 46.8
Sept.	7	24 5.3	62 54.8	3 18.7	245 56.5	324 32.6
	17	24 6.1	62 23.8	3 17.8	245 24.8	96 18.5
	27	24 6.8	61 52.9	3 16.9	244 53.0	228 4.3
Oct.	7	24 7.5	61 22.0	3 16.0	244 21.2	359 50.1
	17	24 8.2	60 51.0	3 15.0	243 49.4	131 36.0
	27	24 8.9	60 20.0	3 13.9	243 17.7	263 21.8
Nov.	6	24 9.6	59 49.1	3 12.9	242 45.9	35 7.6
	16	24 10.3	59 18.2	3 11.9	242 14.1	166 53.5
	26	24 11.0	58 47.4	3 10.9	241 42.4	298 39.3
Dec.	6	24 11.7	58 16.6	3 9.9	241 10.6	70 25.1
	16	24 12.4	57 45.9	3 8.8	240 38.8	202 11.0
	26	24 13.1	57 15.1	3 7.8	240 7.0	333 56.8
	36	24 13.8	56 44.3	3 6.7	239 35.3	105 42.7

Mean Solar Days.	Motion of ☾
	° ′
0.1	1 19.06
0.2	2 38.12
0.3	3 57.18
0.4	5 16.23
0.5	6 35.29
0.6	7 54.35
0.7	9 13.41
0.8	10 32.47
0.9	11 51.53
1.0	13 10.58
2.0	26 21.17
3.0	39 31.75
4.0	52 42.33
5.0	65 52.92
6.0	79 3.50
7.0	92 14.09
8.0	105 24.67
9.0	118 35.25
10.0	131 45.84
Hours.	° ′
1	0 32.94
2	1 5.88
3	1 38.82
4	2 11.76
5	2 44.70
6	3 17.65
7	3 50.59
8	4 23.53
9	4 56.47
10	5 29.41
11	6 2.35
12	6 35.29
13	7 8.23
14	7 41.17
15	8 14.11
16	8 47.06
17	9 20.00
18	9 52.94
19	10 25.88
20	10 58.82
21	11 31.76
22	12 4.70
23	12 37.64

QUANTITIES REQUIRED IN COMPUTING THE MOON'S LIBRATION.

ARGUMENT, (☊−λ), or (☊−λ−180°).

☊−λ	Δλ	$\frac{1}{a}$	*B*	☊−λ
°	′		° ′	°
0	0.0	39	0 0.0	180
2	0.0	39	0 3.1	178
4	0.1	39	0 6.2	176
6	0.2	39	0 9.3	174
8	0.2	39	0 12.4	172
10	0.2	39	0 15.4	170
12	0.3	40	0 18.5	168
14	0.3	40	0 21.5	166
16	0.3	40	0 24.5	164
18	0.3	41	0 27.4	162
20	0.4	41	0 30.4	160
22	0.4	42	0 33.2	158
24	0.4	42	0 36.1	156
26	0.5	43	0 38.9	154
28	0.5	44	0 41.7	152
30	0.5	45	0 44.4	150
32	0.5	46	0 47.0	148
34	0.5	47	0 49.7	146
36	0.5	48	0 52.2	144
38	0.6	49	0 54.7	142
40	0.6	50	0 57.1	140
42	0.6	52	0 59.4	138
44	0.6	54	1 1.7	136
46	0.6	56	1 3.9	134
48	0.6	58	1 6.0	132
50	0.6	60	1 8.0	130
52	0.6	63	1 10.0	128
54	0.5	66	1 11.8	126
56	0.5	69	1 13.6	124
58	0.5	73	1 15.3	122
60	0.5	77	1 16.9	120
62	0.5	83	1 18.4	118
64	0.5	89	1 19.8	116
66	0.4	95	1 21.1	114
68	0.4	103	1 22.3	112
70	0.4	113	1 23.4	110
72	0.4	125	1 24.4	108
74	0.3	141	1 25.3	106
76	0.3	160	1 26.1	104
78	0.2	186	1 26.8	102
80	0.2	222	1 27.4	100
82	0.2	278	1 27.9	98
84	0.1	370	1 28.3	96
86	0.1	555	1 28.6	94
88	0.0	1110	1 28.7	92
90	0.0	∞	1 28.8	90

Δλ has the sign of tan (λ −☊)

***a* has the sign of cos (☊ − λ)**

***B* has the sign of sin (☊ − λ)**

SUN'S ABERRATION AND HORIZONTAL PARALLAX.

FOR GREENWICH MEAN NOON.

Date.	Aberration.	Hor. Par.
1900.	″	″
Jan. 0	− 20.81	8.95
10	20.81	8.95
20	20.79	8.94
30	20.77	8.93
Feb. 9	20.74	8.92
19	− 20.69	8.90
March 1	20.64	8.88
11	20.59	8.85
21	20.53	8.83
31	20.47	8.81
April 10	− 20.42	8.78
20	20.36	8.75
30	20.31	8.73
May 10	20.26	8.71
20	20.22	8.69
30	− 20.18	8.68
June 9	20.15	8.67
19	20.14	8.66
29	20.13	8.65
July 9	20.13	8.66
19	− 20.14	8.66
29	20.16	8.67
Aug. 8	20.19	8.68
18	20.22	8.70
28	20.27	8.72
Sept. 7	− 20.32	8.74
17	20.37	8.76
27	20.43	8.78
Oct. 7	20.49	8.81
17	20 54	8.83
27	− 20.60	8.86
Nov. 6	20.65	8.88
16	20.70	8.90
26	20.74	8.92
Dec. 6	20.77	8.93
16	− 20.80	8.94
26	20.81	8.95
36	− 20.81	8.95

Sun's Mean Equatorial Horizontal Parallax.

8″.80; log = 0.94448.

FOR GREENWICH MEAN NOON.

Date.	In Longitude.		In R. A.	In Obliquity.	Obliquity.	Date.	In Longitude.		In R. A.	In Obliquity.	Obliquity.
	Precession from 1900.0.	Nutation.	Nutation.	Nutation.			Precession from 1900.0.	Nutation.	Nutation.	Nutation.	
	"	"	s	"	23° 27′ "		"	"	s	"	23° 27′ "
Jan. 0	− 0.04	+17.44	+1.067	−2.18	6.08	July 4	25.41	+16.77	+1.025	−3.66	4.36
5	+ 0.65	17.65	1.080	2.17	6.08	9	26.10	16.91	1.034	3.67	4.35
10	1.34	17.82	1.090	2.16	6.09	14	26.79	17.03	1.042	3.65	4.36
15	2.03	17.97	1.099	2.13	6.11	19	27.48	17.13	1.048	3.62	4.38
20	2.71	18.10	1.107	2.09	6.14	24	28.17	17.21	1.052	3.59	4.41
25	3.40	+18.19	+1.113	−2.05	6.18	29	28.85	+17.25	+1.055	−3.55	4.44
30	4.09	18.25	1.116	2.00	6.22	Aug. 3	29.54	17.26	1.056	3.50	4.48
Feb. 4	4.78	18.25	1.117	1.95	6.27	8	30.23	17.23	1.054	3.45	4.53
9	5.46	18.23	1.115	1.89	6.32	13	30.92	17.17	1.051	3.40	4.57
14	6.15	18.16	1.111	1.84	6.36	18	31.60	17.08	1.045	3.36	4.61
19	6.84	+18.06	+1.105	−1.80	6.40	23	32.29	+16.96	+1.037	−3.31	4.65
24	7.53	17.92	1.096	1.76	6.43	28	32.98	16.80	1.027	3.27	4.68
Mar. 1	8.22	17.74	1.085	1.72	6.46	Sept. 2	33.67	16.62	1.016	3.25	4.70
6	8.91	17.54	1.072	1.71	6.47	7	34.35	16.41	1.004	3.23	4.71
11	9.59	17.32	1.059	1.71	6.46	12	35.04	16.19	0.990	3.23	4.70
16	10.28	+17.09	+1.046	−1.73	6.43	17	35.73	+15.95	+0.976	−3.25	4.68
21	10.97	16.86	1.032	1.77	6.39	22	36.42	15.70	0.961	3.28	4.64
26	11.66	16.63	1.017	1.82	6.33	27	37.11	15.45	0.945	3.32	4.59
31	12.34	16.40	1.003	1.88	6.26	Oct. 2	37.80	15.21	0.930	3.38	4.53
Apr. 5	13.03	16.19	0.990	1.97	6.17	7	38.48	14.98	0.916	3.45	4.45
10	13.72	+15.99	+0.978	−2.06	6.07	12	39.17	+14.76	+0.903	−3.54	4.36
15	14.41	15.82	0.968	2.17	5.96	17	39.86	14.57	0.891	3.64	4.25
20	15.09	15.68	0.959	2.28	5.84	22	40.55	14.41	0.881	3.75	4.13
25	15.78	15.56	0.952	2.40	5.71	27	41.23	14.28	0.873	3.88	4.00
30	16.47	15.47	0.946	2.55	5.56	Nov. 1	41.92	14.18	0.867	4.01	3.86
May 5	17.16	+15.43	+0.943	−2.68	5.42	6	42.61	+14.12	+0.864	−4.14	3.72
10	17.85	15.42	0.943	2.80	5.29	11	43.30	14.10	0.863	4.28	3.58
15	18.54	15.44	0.944	2.94	5.15	16	43.98	14.11	0.864	4.41	3.44
20	19.22	15.49	0.947	3.06	5.02	21	44.67	14.17	0.867	4.53	3.31
25	19.91	15.57	0.952	3.17	4.90	26	45.36	14.27	0.873	4.66	3.18
30	20.60	+15.68	+0.959	−3.28	4.79	Dec. 1	46.05	+14.40	+0.881	−4.77	3.06
June 4	21.29	15.81	0.967	3.38	4.68	6	46.74	14.55	0.890	4.87	2.95
9	21.97	15.95	0.976	3.48	4.58	11	47.43	14.72	0.900	4.96	2.86
14	22.66	16.11	0.986	3.55	4.50	16	48.11	14.90	0.911	5.02	2.79
19	23.35	16.28	0.996	3.59	4.45	21	48.80	15.10	0.923	5.07	2.74
24	24.04	+16.45	+1.006	−3.63	4.41	26	49.49	+15.30	+0.936	−5.10	2.71
29	24.72	16.62	1.016	3.66	4.37	31	50.18	15.50	0.948	5.11	2.69
July 4	25.41	+16.77	+1.025	−3.66	4.36	36	50.87	+15.67	+0.958	−5.10	2.67

Mean Obliquity, 1900.0, 23° 27′ 8″.26 (NEWCOMB).

Precession for 1900 . . . . 50″.2482 log = 1.70112

Precession in a Solar Day . . . . 0″.1376 log = 9.13854

Precession in a Sidereal Day . . . . 0″.1372 log = 9.13735

FOR GREENWICH MEAN NOON.

Date.	δψ	δε	Date.	δψ	δε	Date.	δψ	δε	Date.	δψ	δε
	″	″		″	″		″	″		″	″
Jan. 0	− 0.05	− 0.09	Feb. 15	+ 0.11	+ 0.07	Apr. 2	− 0.14	− 0.03	May 18	+ 0.08	− 0.07
1	+ 0.05	0.07	16	+ 0.02	0.08	3	− 0.08	0.06	19	0.14	− 0.03
2	0.14	0.04	17	− 0.08	0.07	4	+ 0.01	0.09	20	0.17	+ 0.03
3	0.19	− 0.01	18	0.16	0.06	5	0.10	0.09	21	0.15	0.06
4	0.18	+ 0.04	19	0.24	+ 0.03	6	0.18	0.07	22	0.09	0.08
5	0.13	0.07	20	0.26	0.00	7	0.23	− 0.05	23	+ 0.01	0.09
6	+ 0.06	0.08	21	0.26	− 0.03	8	0.25	0.00	24	− 0.09	0.07
7	− 0.03	0.08	22	0.21	0.07	9	0.23	+ 0.04	25	0.15	0.04
8	0.10	0.06	23	0.13	0.08	10	0.18	0.06	26	0.18	+ 0.01
9	0.15	+ 0.02	24	− 0.02	0.08	11	0.11	0.08	27	0.16	− 0.04
10	− 0.14	− 0.02	25	+ 0.07	− 0.07	12	+ 0.01	+ 0.08	28	− 0.09	− 0.07
11	0.09	0.06	26	0.15	− 0.05	13	− 0.08	0.07	29	+ 0.01	0.08
12	− 0.02	0.09	27	0.18	0.00	14	0.16	0.04	30	0.10	0.09
13	+ 0.07	0.09	28	0.15	+ 0.04	15	0.21	+ 0.02	31	0.18	0.06
14	0.14	0.07	Mar. 1	0.09	0.07	16	0.24	− 0.01	June 1	0.24	− 0.04
15	0.19	0.05	2	+ 0.01	0.09	17	0.22	0.04	2	0.24	+ 0.01
16	0.22	− 0.01	3	− 0.08	0.08	18	0.18	0.08	3	0.19	0.05
17	0.20	+ 0.03	4	0.14	+ 0.05	19	0.10	0.08	4	0.14	0.07
18	0.15	0.06	5	0.17	0.00	20	− 0.02	0.08	5	+ 0.06	0.07
19	+ 0.07	0.08	6	0.12	− 0.04	21	+ 0.07	0.05	6	− 0.02	0.07
20	− 0.01	+ 0.08	7	− 0.05	− 0.07	22	+ 0.14	− 0.02	7	− 0.10	+ 0.06
21	0.10	0.07	8	+ 0.04	0.10	23	0.16	+ 0.02	8	0.18	0.04
22	0.17	0.06	9	0.13	0.09	24	0.12	0.06	9	0.22	+ 0.01
23	0.23	+ 0.02	10	0.20	0.07	25	+ 0.05	0.08	10	0.25	− 0.03
24	0.26	0.00	11	0.24	− 0.03	26	− 0.03	0.09	11	0.19	0.06
25	0.24	− 0.04	12	0.25	+ 0.01	27	0.11	0.07	12	0.13	0.07
26	0.18	0.08	13	0.22	0.05	28	0.16	+ 0.03	13	− 0.04	0.08
27	0.09	0.09	14	0.15	0.07	29	0.18	− 0.01	14	+ 0.06	0.07
28	− 0.01	0.08	15	+ 0.07	0.08	30	0.13	0.05	15	0.12	− 0.04
29	+ 0.08	0.05	16	− 0.01	0.08	May 1	− 0.04	0.08	16	0.17	0.00
30	+ 0.16	− 0.02	17	− 0.12	+ 0.07	2	+ 0.03	− 0.09	17	+ 0.16	+ 0.03
31	0.19	+ 0.02	18	0.20	0.05	3	0.13	0.08	18	0.11	0.07
Feb. 1	0.16	0.05	19	0.25	+ 0.01	4	0.20	0.06	19	+ 0.04	0.08
2	0.08	0.09	20	0.24	− 0.03	5	0.24	− 0.02	20	− 0.05	0.08
3	+ 0.02	0.09	21	0.22	0.06	6	0.23	+ 0.02	21	0.13	0.06
4	− 0.05	0.07	22	0.16	0.08	7	0.18	0.05	22	0.18	+ 0.01
5	0.09	+ 0.03	23	− 0.07	0.08	8	0.11	0.08	23	0.16	− 0.03
6	0.13	− 0.01	24	+ 0.03	0.08	9	+ 0.04	0.08	24	0.10	0.06
7	0.09	0.05	25	0.11	− 0.04	10	− 0.06	0.07	25	− 0.02	0.09
8	− 0.03	0.08	26	0.16	0.00	11	0.14	0.06	26	+ 0.07	0.09
9	+ 0.05	− 0.09	27	+ 0.16	+ 0.04	12	− 0.19	+ 0.03	27	+ 0.16	− 0.07
10	0.14	0.08	28	0.10	0.07	13	0.23	0.00	28	0.21	− 0.04
11	0.19	0.06	29	+ 0.02	0.09	14	0.22	− 0.03	29	0.23	0.00
12	0.22	− 0.02	30	− 0.07	0.08	15	0.19	0.07	30	0.20	+ 0.04
13	0.22	+ 0.02	31	0.14	0.06	16	0.11	0.08	July 1	0.15	0.06
14	0.17	0.06	Apr. 1	0.16	+ 0.02	17	− 0.01	0.08	2	+ 0.07	0.08
15	+ 0.11	+ 0.07	2	− 0.14	− 0.03	18	+ 0.08	− 0.07	3	− 0.02	+ 0.08

FOR GREENWICH MEAN NOON.

Date.	δψ	δε	Date.	δψ	δε	Date.	δψ	δε	Date.	δψ	δε
	″	″		″	″		″	″		″	″
July 3	− 0.02	+ 0.08	Aug. 18	− 0.05	− 0.07	Oct. 3	+ 0.11	− 0.02	Nov. 18	− 0.06	+ 0.06
4	0.11	0.07	19	+ 0.02	0.09	4	0.13	+ 0.02	19	0.14	0.03
5	0.16	0.05	20	0.12	0.08	5	0.10	0.06	20	0.17	+ 0.01
6	0.21	+ 0.02	21	0.20	0.07	6	+ 0.04	0.08	21	0.18	− 0.02
7	0.23	− 0.02	22	0.25	− 0.03	7	− 0.04	0.08	22	0.16	0.06
8	0.22	0.05	23	0.25	+ 0.01	8	0.12	0.07	23	0.12	0.07
9	0.16	0.07	24	0.20	0.05	9	0.16	+ 0.04	24	− 0.05	0.08
10	− 0.07	0.09	25	0.13	0.07	10	0.18	− 0.01	25	+ 0.02	0.06
11	+ 0.02	0.08	26	+ 0.05	0.08	11	0.13	0.04	26	0.08	− 0.04
12	0.10	0.05	27	− 0.04	0.07	12	− 0.06	0.08	27	0.13	0.00
13	+ 0.16	− 0.01	28	− 0.13	+ 0.07	13	+ 0.03	− 0.09	28	+ 0.11	+ 0.04
14	0.22	+ 0.03	29	0.19	0.04	14	0.13	0.08	29	+ 0.07	0.06
15	0.14	0.06	30	0.24	+ 0.01	15	0.20	0.05	30	0.00	0.08
16	+ 0.06	0.08	31	0.24	− 0.02	16	0.23	− 0.02	Dec. 1	− 0.07	0.08
17	− 0.02	0.08	Sept. 1	0.21	0.06	17	0.23	+ 0.02	2	0.13	0.05
18	0.09	0.07	2	0.16	0.08	18	0.21	0.05	3	0.18	+ 0.01
19	0.15	+ 0.03	3	− 0.07	0.08	19	0.14	0.08	4	0.17	− 0.03
20	0.17	− 0.01	4	+ 0.02	0.08	20	+ 0.05	0.08	5	0.12	0.06
21	0.11	0.04	5	0.09	− 0.04	21	− 0.04	0.07	6	− 0.03	0.08
22	− 0.04	0.08	6	0.15	0.00	22	0.11	0.05	7	+ 0.07	0.09
23	+ 0.05	− 0.09	7	+ 0.16	+ 0.03	23	− 0.18	+ 0.02	8	+ 0.17	− 0.07
24	0.14	0.08	8	0.10	0.07	24	0.21	− 0.02	9	0.23	− 0.04
25	0.20	0.06	9	+ 0.03	0.09	25	0.20	0.05	10	0.25	0.00
26	0.23	− 0.02	10	− 0.06	0.08	26	0.18	0.07	11	0.22	+ 0.04
27	0.22	+ 0.02	11	0.12	0.05	27	0.12	0.09	12	0.18	0.06
28	0.16	0.05	12	0.16	+ 0.02	28	− 0.04	0.08	13	0.11	0.07
29	0.09	0.07	13	0.16	− 0.03	29	+ 0.04	0.05	14	+ 0.03	0.07
30	+ 0.02	0.08	14	− 0.10	0.06	30	0.09	− 0.01	15	− 0.06	0.07
31	− 0.08	0.07	15	0.00	0.08	31	0.13	+ 0.03	16	0.14	0.05
Aug. 1	0.16	0.06	16	+ 0.10	0.09	Nov. 1	0.12	0.06	17	0.18	+ 0.02
2	− 0.22	+ 0.03	17	+ 0.19	− 0.07	2	+ 0.05	+ 0.08	18	− 0.19	− 0.01
3	0.23	0.00	18	0.26	− 0.04	3	− 0.03	0.08	19	0.17	0.05
4	0.23	− 0.03	19	0.27	0.00	4	0.11	0.07	20	0.13	0.07
5	0.19	0.07	20	0.24	+ 0.04	5	0.16	+ 0.03	21	− 0.07	0.08
6	0.11	0.08	21	0.18	0.06	6	0.19	− 0.02	22	+ 0.01	0.08
7	− 0.02	0.08	22	0.10	0.07	7	0.16	0.06	23	0.08	0.05
8	+ 0.05	0.07	23	+ 0.02	0.08	8	− 0.08	0.08	24	0.12	− 0.01
9	0.13	− 0.03	24	− 0.08	0.07	9	+ 0.01	0.09	25	0.15	+ 0.02
10	0.18	+ 0.01	25	0.14	0.04	10	0.11	0.07	26	0.11	0.06
11	0.15	0.05	26	0.21	+ 0.02	11	0.20	0.06	27	+ 0.05	0.08
12	+ 0.10	+ 0.07	27	− 0.22	− 0.01	12	+ 0.25	− 0.01	28	− 0.03	+ 0.08
13	+ 0.02	0.09	28	0.21	0.04	13	0.25	+ 0.03	29	0.10	0.06
14	− 0.06	0.08	29	0.17	0.07	14	0.23	0.05	30	0.16	+ 0.03
15	0.13	+ 0.04	30	0.10	0.07	15	0.17	0.07	31	0.19	− 0.01
16	0.16	0.00	Oct. 1	− 0.02	0.08	16	0.10	0.08	32	0.15	0.04
17	0.12	− 0.04	2	+ 0.05	0.05	17	+ 0.02	0.07	33	− 0.07	0.08
18	− 0.05	− 0.07	3	+ 0.11	− 0.02	18	− 0.06	+ 0.06	34	+ 0.02	− 0.09

PART II

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS.

NOTATION.

τ, the time in units of one year from the beginning of the Besselian fictitious year, 1899, December $31^{d}.099 = 1900$, January $0^{d}.099$, Washington mean time,
α_0, δ_0, the star's mean right ascension and declination at the beginning of the fictitious year,
α, δ, the star's apparent right ascension and declination at the time τ,
μ, μ', the annual proper motion in right ascension and declination,
$\odot$, the sun's true longitude,
☊, the longitude of the moon's ascending node,
ε, the obliquity of the ecliptic,
Γ', the longitude of the moon's perigee,
☾, the moon's mean longitude,
$\delta\psi$, the nutation in longitude, including the terms of short period,
$\delta\varepsilon$, the nutation in obliquity, including the terms of short period,
p_0, the annual lunisolar precession $= 50''.3626$.

BESSELIAN STAR-NUMBERS.

$$A = \tau + \frac{\delta\psi}{p_0} \qquad C = -20''.47 \cos\varepsilon \cos\odot$$
$$B = -\delta\varepsilon \qquad D = -20''.47 \sin\odot$$
$$E = -0''.0450 \sin\text{☊} + 0''.0014 \sin 2\,\text{☊} - 0''.0032 \sin 2\odot$$

BESSEL'S *Star-Constants.*

$$a = 3^{s}.07184 + 1^{s}.33624 \sin\alpha_0 \tan\delta_0 = \text{precession in right ascension}$$
$$b = \tfrac{1}{15}\cos\alpha_0 \tan\delta_0$$
$$c = \tfrac{1}{15}\cos\alpha_0 \sec\delta_0$$
$$d = \tfrac{1}{15}\sin\alpha_0 \sec\delta_0$$

$$a' = 20''.0436 \cos\alpha_0 = \text{precession in declination}$$
$$b' = -\sin\alpha_0$$
$$c' = \tan\varepsilon \cos\delta_0 - \sin\alpha_0 \sin\delta_0$$
$$d' = \cos\alpha_0 \sin\delta_0$$

Reduction to Apparent Position.

$$\alpha = \alpha_0 + \tau\mu + Aa + Bb + Cc + Dd + \tfrac{1}{15}E \qquad \text{(in time)}$$
$$\delta = \delta_0 + \tau\mu' + Aa' + Bb' + Cc' + Dd' \qquad \text{(in arc)}$$

INDEPENDENT STAR-NUMBERS.

$$f + f' = 46''.0776\,A + E \text{ (in arc)} = 3.07184\,A + \tfrac{1}{15}E \qquad \text{(in time)}$$
$$f' = -0''.1866 \sin 2\,\text{☾} + 0''.0622 \sin(\text{☾} - \Gamma')$$
$$g \sin G = B \qquad h \sin H = C$$
$$g \cos G = 20''.0436\,A \qquad h \cos H = D \qquad i = C \tan\varepsilon$$

Reduction to Apparent Position.

$$\alpha = \alpha_0 + f + f' + \tau\mu + \tfrac{1}{15}g \sin(G + \alpha_0) + \tfrac{1}{15}h \sin(H + \alpha_0) \sec\delta_0 \qquad \text{(in time)}$$
$$\delta = \delta_0 + \tau\mu' + g\cos(G + \alpha_0) + h\cos(H + \alpha_0)\sin\delta_0 + i\cos\delta_0 \qquad \text{(in arc)}$$

NOTES.—(1) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when BESSEL'S star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.

(2) In using the star-constants of the *British Association Catalogue*, $a, b, c, d, a', b', c', d'$, must be changed to $c, d, a, b, -c', -d', -a', -b'$, respectively.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Jan. 0	+9.5423	+0.3560	−0.5291	+1.3040	Feb. 15	+9.6888	+0.2430	−1.1978	+1.0461
1	9.5491	0.3522	0.5693	1.3026	16	9.6889	0.2380	1.2027	1.0340
2	9.5545	0.3464	0.6060	1.3009	17	9.6890	0.2355	1.2073	1.0215
3	9.5593	0.3365	0.6397	1.2992	18	9.6899	0.2380	1.2118	1.0084
4	9.5629	0.3263	0.6708	1.2972	(10^{h}.0) 19	9.6911	0.2430	1.2161	0.9949
(7^{h}.0) 5	+9.5651	+0.3222	−0.6998	+1.2952	20	+9.6932	+0.2504	−1.2203	+0.9808
6	9.5673	0.3181	0.7268	1.2930	21	9.6956	0.2577	1.2242	0.9660
7	9.5690	0.3201	0.7520	1.2906	22	9.6986	0.2625	1.2280	0.9506
8	9.5719	0.3263	0.7758	1.2881	23	9.7021	0.2648	1.2316	0.9345
9	9.5756	0.3324	0.7982	1.2854	24	9.7056	0.2601	1.2350	0.9176
10	+9.5797	+0.3385	−0.8193	+1.2826	25	+9.7088	+0.2553	−1.2383	+0.8999
11	9.5853	0.3463	0.8394	1.2796	26	9.7113	0.2480	1.2415	0.8814
12	9.5912	0.3502	0.8584	1.2765	27	9.7129	0.2355	1.2444	0.8619
13	9.5971	0.3463	0.8765	1.2732	28	9.7140	0.2201	1.2472	0.8414
14	9.6021	0.3424	0.8937	1.2697	Mar. 1	9.7145	0.2148	1.2499	0.8197
15	+9.6062	+0.3345	−0.9102	+1.2661	2	+9.7147	+0.2122	−1.2524	+0.7967
16	9.6099	0.3243	0.9259	1.2623	3	9.7151	0.2175	1.2548	0.7723
17	9.6119	0.3181	0.9409	1.2584	4	9.7161	0.2279	1.2570	0.7464
18	9.6142	0.3096	0.9553	1.2542	5	9.7177	0.2355	1.2591	0.7187
19	9.6158	0.3053	0.9691	1.2499	6	9.7197	0.2455	1.2610	0.6889
(8^{h}.0) 20	+9.6173	+0.3032	−0.9824	+1.2454	(11^{h}.0) 7	+9.7222	+0.2529	−1.2628	+0.6570
21	9.6191	0.3010	0.9951	1.2407	8	9.7254	0.2553	1.2645	0.6222
22	9.6207	0.3032	1.0073	1.2359	9	9.7283	0.2529	1.2660	0.5839
23	9.6227	0.3118	1.0190	1.2308	10	9.7308	0.2504	1.2673	0.5421
24	9.6261	0.3160	1.0303	1.2255	11	9.7332	0.2430	1.2689	0.4959
25	+9.6304	+0.3222	−1.0412	+1.2200	12	+9.7346	+0.2330	−1.2699	+0.4440
26	9.6349	0.3243	1.0516	1.2144	13	9.7349	0.2279	1.2707	0.3850
27	9.6397	0.3243	1.0617	1.2085	14	9.7349	0.2201	1.2715	0.3166
28	9.6447	0.3201	1.0715	1.2024	15	9.7350	0.2175	1.2722	0.2353
29	9.6492	0.3096	1.0808	1.1961	16	9.7351	0.2201	1.2728	0.1351
30	+9.6524	+0.2989	−1.0899	+1.1896	17	+9.7352	+0.2253	−1.2732	+0.0044
31	9.6552	0.2856	1.0986	1.1828	18	9.7360	0.2330	1.2735	9.8166
Feb. 1	9.6565	0.2765	1.1070	1.1757	19	9.7371	0.2430	1.2737	+9.4784
2	9.6576	0.2695	1.1151	1.1684	20	9.7386	0.2553	1.2737	−8.7303
3	9.6587	0.2695	1.1230	1.1609	21	9.7411	0.2648	1.2736	9.6108
(9^{h}.0) 4	+9.6600	+0.2695	−1.1305	+1.1531	(12^{h}.0) 22	+9.7439	+0.2718	−1.2734	−9.8821
5	9.6620	0.2765	1.1378	1.1450	23	9.7466	0.2742	1.2731	0.0475
6	9.6650	0.2833	1.1448	1.1367	24	9.7493	0.2718	1.2726	0.1671
7	9.6687	0.2923	1.1516	1.1280	25	9.7519	0.2648	1.2720	0.2605
8	9.6727	0.2945	1.1582	1.1190	26	9.7533	0.2577	1.2713	0.3372
9	+9.6765	+0.2923	−1.1645	+1.1097	27	+9.7545	+0.2529	−1.2704	−0.4023
10	9.6804	0.2878	1.1706	1.1000	28	9.7547	0.2480	1.2694	0.4586
11	9.6834	0.2810	1.1764	1.0900	29	9.7547	0.2480	1.2683	0.5084
12	9.6854	0.2718	1.1821	1.0796	30	9.7549	0.2553	1.2670	0.5528
13	9.6869	0.2601	1.1875	1.0689	31	9.7554	0.2648	1.2656	0.5930
14	+9.6881	+0.2504	−1.1928	+1.0577	Apr. 1	+9.7568	+0.2765	−1.2641	−0.6295
15	+9.6888	+0.2430	−1.1978	+1.0461	2	+9.7589	+0.2900	−1.2625	−0.6632

E = + $0''.04$ = + $0^{s}.003$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid Hour.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
Apr. 1	+9.7568	+0.2765	−1.2641	−0.6295	May 17	+9.8353	+0.4900	−1.0123	−1.2337
2	9.7589	0.2900	1.2625	0.6632	18	9.8379	0.4900	1.0010	1.2384
3	9.7615	0.3032	1.2607	0.6943	19	9.8402	0.4871	0.9892	1.2429
4	9.7644	0.3075	1.2588	0.7232	20	9.8422	0.4843	0.9769	1.2473
5	9.7673	0.3118	1.2567	0.7502	21	9.8435	0.4814	0.9642	1.2515
^{h} 13.0) 6	+9.7699	+0.3139	−1.2545	−0.7755	^{h} (16.0) 22	+9.8442	+0.4814	−0.9511	−1.2555
7	9.7716	0.3118	1.2522	0.7992	23	9.8451	0.4843	0.9374	1.2593
8	9.7731	0.3075	1.2497	0.8216	24	9.8460	0.4900	0.9230	1.2630
9	9.7739	0.3054	1.2471	0.8427	25	9.8475	0.4983	0.9080	1.2666
10	9.7742	0.3032	1.2443	0.8627	26	9.8495	0.5079	0.8924	1.2700
11	+9.7746	+0.3032	−1.2414	−0.8817	27	+9.8521	+0.5159	−0.8762	−1.2732
12	9.7747	0.3075	1.2384	0.8998	28	9.8553	0.5224	0.8592	1.2763
13	9.7749	0.3139	1.2352	0.9171	29	9.8583	0.5263	0.8414	1.2793
14	9.7755	0.3222	1.2318	0.9335	30	9.8611	0.5289	0.8226	1.2821
15	9.7767	0.3324	1.2283	0.9492	31	9.8638	0.5289	0.8029	1.2848
16	+9.7782	+0.3464	−1.2246	−0.9642	June 1	+9.8660	+0.5263	−0.7822	−1.2873
17	9.7800	0.3578	1.2208	0.9787	2	9.8677	0.5237	0.7603	1.2897
18	9.7827	0.3674	1.2169	0.9924	3	9.8690	0.5224	0.7371	1.2920
19	9.7855	0.3747	1.2127	1.0057	4	9.8701	0.5224	0.7125	1.2942
20	9.7883	0.3766	1.2084	1.0184	5	9.8712	0.5237	0.6862	1.2962
^{h} (14.0) 21	+9.7909	+0.3766	−1.2040	−1.0307	^{h} (17.0) 6	+9.8722	+0.5250	−0.6582	−1.2980
22	9.7930	0.3747	1.1994	1.0424	7	9.8732	0.5289	0.6281	1.2998
23	9.7941	0.3692	1.1946	1.0538	8	9.8745	0.5328	0.5957	1.3014
24	9.7950	0.3674	1.1896	1.0647	9	9.8762	0.5391	0.5602	1.3029
25	9.7954	0.3692	1.1844	1.0752	10	9.8784	0.5465	0.5217	1.3042
26	+9.7958	+0.3747	−1.1790	−1.0854	11	+9.8809	+0.5514	−0.4794	−1.3055
27	9.7967	0.3838	1.1735	1.0952	12	9.8838	0.5563	0.4324	1.3066
28	9.7981	0.3962	1.1678	1.1046	13	9.8867	0.5575	0.3796	1.3076
29	9.8002	0.4074	1.1618	1.1137	14	9.8896	0.5575	0.3194	1.3085
30	9.8030	0.4183	1.1556	1.1225	15	9.8921	0.5551	0.2491	1.3093
May 1	+9.8059	+0.4281	−1.1493	−1.1309	16	+9.8942	+0.5514	−0.1652	−1.3099
2	9.8091	0.4298	1.1427	1.1392	17	9.8957	0.5478	0.0610	1.3104
3	9.8118	0.4314	1.1359	1.1472	18	9.8968	0.5441	9.9235	1.3107
4	9.8142	0.4330	1.1289	1.1548	19	9.8976	0.5441	9.7210	1.3110
5	9.8160	0.4314	1.1216	1.1622	20	9.8986	0.5465	−9.3291	1.3112
^{h} 6	+9.8172	+0.4298	−1.1141	−1.1694	^{h} (18.0) 21	+9.8998	+0.5514	+8.9972	−1.3112
(15.0) 7	9.8181	0.4298	1.1064	1.1763	22	9.9015	0.5575	9.6149	1.3111
8	9.8191	0.4314	1.0983	1.1830	23	9.9038	0.5623	9.8603	1.3109
9	9.8196	0.4330	1.0900	1.1895	24	9.9065	0.5682	0.0157	1.3105
10	9.8202	0.4378	1.0814	1.1957	25	9.9093	0.5717	0.1300	1.3101
11	+9.8211	+0.4456	−1.0726	−1.2017	26	+9.9122	+0.5717	+0.2203	−1.3095
12	9.8225	0.4548	1.0634	1.2076	27	9.9147	0.5705	0.2951	1.3088
13	9.8243	0.4639	1.0539	1.2132	28	9.9168	0.5670	0.3584	1.3080
14	9.8266	0.4728	1.0440	1.2186	29	9.9185	0.5635	0.4137	1.3070
15	9.8293	0.4814	1.0338	1.2238	30	9.9198	0.5587	0.4626	1.3059
16	+9.8322	+0.4871	−1.0233	−1.2288	July 1	+9.9207	+0.5563	+0.5063	−1.3047
17	+9.8353	+0.4900	−1.0123	−1.2337	2	+9.9215	+0.5551	+0.5460	−1.3034

$E = +0''.04 = +0^{s}.003$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hour.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.
July	1	+9.9207	+0.5563	+0.5063	−1.3047	Aug.	16	+9.9832	+0.5276	+1.1807	−1.0823
	2	9.9215	0.5551	0.5460	1.3034		17	9.9845	0.5315	1.1859	1.0722
	3	9.9224	0.5551	0.5823	1.3019		18	9.9862	0.5340	1.1910	1.0616
	4	9.9234	0.5563	0.6157	1.3004		19	9.9880	0.5340	1.1959	1.0507
	5	9.9246	0.5587	0.6466	1.2987		20	9.9898	0.5328	1.2006	1.0394
$(19^{\mathrm{h}}.0)$	6	+9.9259	+0.5623	+0.6753	−1.2969	$(22^{\mathrm{h}}.0)$	21	+9.9915	+0.5289	+1.2051	−1.0277
	7	9.9275	0.5670	0.7021	1.2950		22	9.9928	0.5224	1.2095	1.0155
	8	9.9297	0.5705	0.7273	1.2929		23	9.9936	0.5159	1.2137	1.0027
	9	9.9321	0.5729	0.7510	1.2907		24	9.9941	0.5105	1.2177	0.9895
	10	9.9346	0.5740	0.7733	1.2884		25	9.9943	0.5079	1.2216	0.9757
	11	+9.9372	+0.5729	+0.7944	−1.2859		26	+9.9944	+0.5051	+1.2254	−0.9614
	12	9.9394	0.5694	0.8144	1.2833		27	9.9944	0.5038	1.2289	0.9464
	13	9.9413	0.5635	0.8335	1.2805		28	9.9948	0.5051	1.2324	0.9308
	14	9.9429	0.5575	0.8516	1.2776		29	9.9953	0.5092	1.2357	0.9144
	15	9.9438	0.5527	0.8689	1.2746		30	9.9960	0.5132	1.2388	0.8973
	16	+9.9447	+0.5502	+0.8854	−1.2714		31	+9.9971	+0.5185	+1.2418	−0.8793
	17	9.9456	0.5502	0.9012	1.2681	Sept.	1	9.9983	0.5211	1.2446	0.8604
	18	9.9465	0.5514	0.9163	1.2647		2	9.9998	0.5224	1.2473	0.8405
	19	9.9475	0.5551	0.9308	1.2611		3	0.0014	0.5224	1.2499	0.8194
	20	9.9494	0.5599	0.9447	1.2573		4	0.0028	0.5198	1.2524	0.7972
	21	+9.9515	+0.5635	+0.9581	−1.2534	$(23^{\mathrm{h}}.0)$	5	+0.0041	+0.5145	+1.2547	−0.7736
$(20^{\mathrm{h}}.0)$	22	9.9537	0.5647	0.9709	1.2493		6	0.0051	0.5079	1.2568	0.7486
	23	9.9559	0.5635	0.9833	1.2451		7	0.0059	0.5024	1.2588	0.7220
	24	9.9579	0.5623	0.9952	1.2407		8	0.0062	0.4983	1.2607	0.6933
	25	9.9597	0.5587	1.0067	1.2361		9	0.0061	0.4969	1.2625	0.6625
	26	+9.9613	+0.5539	+1.0178	−1.2313		10	+0.0063	+0.4983	+1.2641	−0.6292
	27	9.9624	0.5478	1.0284	1.2264		11	0.0067	0.5024	1.2656	0.5930
	28	9.9633	0.5428	1.0387	1.2213		12	0.0074	0.5079	1.2670	0.5533
	29	9.9637	0.5391	1.0487	1.2160		13	0.0085	0.5145	1.2683	0.5094
	30	9.9642	0.5378	1.0583	1.2105		14	0.0100	0.5198	1.2694	0.4605
	31	+9.9647	+0.5378	+1.0676	−1.2049		15	+0.0115	+0.5224	+1.2704	−0.4052
Aug.	1	9.9654	0.5391	1.0766	1.1991		16	0.0130	0.5211	1.2712	0.3416
	2	9.9663	0.5403	1.0852	1.1930		17	0.0144	0.5198	1.2719	0.2668
	3	9.9675	0.5428	1.0936	1.1867		18	0.0153	0.5159	1.2725	0.1762
	4	9.9690	0.5465	1.1018	1.1802		19	0.0160	0.5119	1.2730	0.0610
	5	+9.9709	+0.5490	+1.1096	−1.1735		20	+0.0164	+0.5092	+1.2734	−9.9046
$(21^{\mathrm{h}}.0)$	6	9.9729	0.5490	1.1172	1.1665	$(0^{\mathrm{h}}.0)$	21	0.0164	0.5079	1.2736	9.6561
	7	9.9750	0.5465	1.1245	1.1593		22	0.0165	0.5065	1.2737	−9.0129
	8	9.9768	0.5428	1.1316	1.1519		23	0.0165	0.5065	1.2737	+9.3930
	9	9.9783	0.5378	1.1385	1.1442		24	0.0165	0.5092	1.2736	9.7763
	10	+9.9795	+0.5315	+1.1452	−1.1363		25	+0.0166	+0.5132	+1.2733	+9.9767
	11	9.9802	0.5250	1.1516	1.1280		26	0.0171	0.5185	1.2729	0.1133
	12	9.9806	0.5198	1.1578	1.1195		27	0.0179	0.5250	1.2723	0.2170
	13	9.9810	0.5185	1.1638	1.1107		28	0.0189	0.5302	1.2717	0.3006
	14	9.9815	0.5198	1.1696	1.1016		29	0.0202	0.5353	1.2709	0.3707
	15	+9.9822	+0.5237	+1.1753	−1.0921		30	+0.0216	+0.5378	+1.2699	+0.4306
	16	+9.9832	+0.5276	+1.1807	−1.0823	Oct.	1	+0.0230	+0.5378	+1.2689	+0.4834

$E = +0''.04 = +0^{\mathrm{s}}.003$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Oct. 1	+0.0230	+0.5378	+1.2689	+0.4834	Nov. 16	+0.0639	+0.6395	+1.0385	+1.2215
2	0.0242	0.5353	1.2677	0.5303	17	0.0643	0.6415	1.0276	1.2268
3	0.0251	0.5328	1.2664	0.5728	18	0.0648	0.6454	1.0165	1.2320
4	0.0258	0.5289	1.2649	0.6111	19	0.0656	0.6503	1.0047	1.2370
5	0.0261	0.5260	1.2633	0.6462	$\overset{h}{(4.0)}$ 20	0.0666	0.6561	0.9923	1.2418
$\overset{h}{(1.0)}$ 6	+0.0263	+0.5250	+1.2616	+0.6787	21	+0.0678	+0.6618	+0.9795	+1.2464
7	0.0264	0.5276	1.2598	0.7088	22	0.0693	0.6675	0.9663	1.2508
8	0.0267	0.5328	1.2578	0.7368	23	0.0709	0.6712	0.9525	1.2550
9	0.0273	0.5391	1.2556	0.7631	24	0.0726	0.6730	0.9381	1.2591
10	0.0282	0.5478	1.2533	0.7878	25	0.0743	0.6739	0.9230	1.2630
11	+0.0296	+0.5551	+1.2509	+0.8109	26	+0.0758	+0.6730	+0.9073	+1.2668
12	0.0312	0.5599	1.2483	0.8328	27	0.0770	0.6712	0.8908	1.2704
13	0.0328	0.5635	1.2456	0.8536	28	0.0779	0.6693	0.8735	1.2738
14	0.0343	0.5647	1.2427	0.8733	29	0.0787	0.6693	0.8553	1.2770
15	0.0355	0.5635	1.2397	0.8920	30	0.0794	0.6702	0.8362	1.2801
16	+0.0363	+0.5611	+1.2365	+0.9098	Dec. 1	+0.0801	+0.6730	+0.8161	+1.2830
17	0.0369	0.5587	1.2332	0.9268	2	0.0810	0.6767	0.7949	1.2858
18	0.0372	0.5587	1.2297	0.9431	3	0.0821	0.6821	0.7724	1.2885
19	0.0373	0.5599	1.2260	0.9586	4	0.0835	0.6884	0.7486	1.2910
20	0.0375	0.5623	1.2222	0.9735	5	0.0853	0.6928	0.7231	1.2933
$\overset{h}{(2.0)}$ 21	+0.0377	+0.5647	+1.2182	+0.9878	$\overset{h}{(5.0)}$ 6	+0.0871	+0.6964	+0.6959	+1.2954
22	0.0379	0.5694	1.2141	1.0015	7	0.0889	0.6981	0.6668	1.2975
23	0.0384	0.5763	1.2098	1.0146	8	0.0907	0.6990	0.6354	1.2994
24	0.0392	0.5832	1.2052	1.0273	9	0.0922	0.6972	0.6015	1.3011
25	0.0403	0.5911	1.2005	1.0395	10	0.0935	0.6946	0.5646	1.3027
26	+0.0416	+0.5966	+1.1956	+1.0512	11	+0.0944	+0.6920	+0.5237	+1.3042
27	0.0431	0.6010	1.1906	1.0625	12	0.0951	0.6911	0.4787	1.3055
28	0.0447	0.6031	1.1853	1.0734	13	0.0957	0.6911	0.4283	1.3067
29	0.0462	0.6031	1.1798	1.0839	14	0.0963	0.6920	0.3712	1.3078
30	0.0474	0.6021	1.1741	1.0940	15	0.0969	0.6946	0.3052	1.3087
31	+0.0483	+0.5999	+1.1683	+1.1038	16	+0.0977	+0.6972	+0.2271	+1.3094
Nov. 1	0.0489	0.5988	1.1622	1.1132	17	0.0987	0.7007	0.1318	1.3101
2	0.0492	0.6000	1.1558	1.1223	18	0.1000	0.7050	0.0091	1.3106
3	0.0495	0.6021	1.1492	1.1311	19	0.1015	0.7093	9.8374	1.3109
4	0.0499	0.6064	1.1424	1.1396	20	0.1033	0.7118	9.5487	1.3111
$\overset{h}{(3.0)}$ 5	+0.0506	+0.6128	+1.1354	+1.1478	$\overset{h}{(6.0)}$ 21	+0.1051	+0.7126	+8.2782	+1.3112
6	0.0517	0.6201	1.1281	1.1557	22	0.1069	0.7126	−9.4974	1.3111
7	0.0532	0.6274	1.1205	1.1634	23	0.1085	0.7110	9.8118	1.3109
8	0.0550	0.6325	1.1126	1.1708	24	0.1098	0.7076	9.9922	1.3106
9	0.0568	0.6365	1.1045	1.1779	25	0.1108	0.7042	0.1192	1.3101
10	+0.0585	+0.6385	+1.0961	+1.1848	26	+0.1114	+0.7016	−0.2172	+1.3095
11	0.0599	0.6395	1.0874	1.1915	27	0.1120	0.7007	0.2970	1.3088
12	0.0611	0.6385	1.0783	1.1979	28	0.1126	0.7007	0.3645	1.3079
13	0.0621	0.6375	1.0689	1.2041	29	0.1134	0.7024	0.4224	1.3069
14	0.0628	0.6365	1.0591	1.2101	30	0.1144	0.7059	0.4735	1.3057
15	+0.0633	+0.6375	+1.0490	+1.2159	31	+0.1157	+0.7093	−0.5176	+1.3044
16	+0.0639	+0.6395	+1.0385	+1.2215	32	+0.1174	+0.7135	−0.5587	+1.3029

$E = +0''.04 = +0^{s}.003$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f	f′	G		H		Log g.	Log k.	i	Log i.
					In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Jan.	0	0.0011	+1.071	+0.003	18 0	1 12.0	350 28	23 21.9	+0.8661	+1.3100	−1.47	−0.1664
	1	0.0038	1.082	0.009	17 35	1 10.3	349 32	23 18.1	0.8719	1.3098	1.61	0.2066
	2	0.0066	1.093	0.011	17 10	1 8.7	348 35	23 14.3	0.8763	1.3095	1.75	0.2433
	3	0.0093	1.104	0.012	16 38	1 6.5	347 39	23 10.6	0.8799	1.3092	1.89	0.2770
h	4	0.0120	1.115	0.011	16 8	1 4.5	346 42	23 6.8	0.8824	1.3090	2.03	0.3081
(7.0)	5	0.0148	+1.126	+0.005	15 55	1 3.7	345 45	23 3.0	+0.8841	+1.3087	−2.17	−0.3371
	6	0.0175	1.137	0.000	15 42	1 2.8	344 48	22 59.2	0.8858	1.3083	2.31	0.3641
	7	0.0203	1.147	−0.006	15 43	1 2.9	343 52	22 55.5	0.8875	1.3080	2.45	0.3893
	8	0.0230	1.158	0.009	15 49	1 3.3	342 55	22 51.7	0.8907	1.3076	2.59	0.4131
	9	0.0257	1.168	0.009	15 54	1 3.6	341 58	22 47.9	0.8945	1.3072	2.73	0.4355
	10	0.0285	+1.179	−0.009	15 59	1 3.9	341 0	22 44.0	+0.8988	+1.3068	−2.86	−0.4566
	11	0.0312	1.190	−0.005	16 3	1 4.2	340 3	22 40.2	0.9046	1.3064	3.00	0.4767
	12	0.0340	1.200	+0.001	15 59	1 3.9	339 6	22 36.4	0.9103	1.3060	3.13	0.4957
	13	0.0367	1.210	0.008	15 39	1 2.6	338 8	22 32.5	0.9155	1.3055	3.26	0.5138
	14	0.0394	1.221	0.011	15 21	1 1.4	337 11	22 28.7	0.9199	1.3050	3.40	0.5310
	15	0.0422	+1.231	+0.012	14 57	0 59.8	336 13	22 24.9	+0.9231	+1.3046	−3.53	−0.5475
	16	0.0449	1.241	0.013	14 30	0 58.0	335 15	22 21.0	0.9259	1.3041	3.66	0.5632
	17	0.0476	1.251	0.009	14 14	0 56.9	334 17	22 17.1	0.9274	1.3036	3.79	0.5782
	18	0.0504	1.261	+0.006	13 54	0 55.6	333 19	22 13.3	0.9291	1.3030	3.91	0.5926
h	19	0.0531	1.271	0.000	13 43	0 54.9	332 21	22 9.4	0.9304	1.3025	4.04	0.6064
(8.0)	20	0.0559	+1.280	−0.004	13 36	0 54.4	331 23	22 5.5	+0.9317	+1.3019	−4.17	−0.6197
	21	0.0586	1.290	0.009	13 29	0 53.9	330 24	22 1.6	0.9332	1.3014	4.29	0.6324
	22	0.0613	1.299	0.013	13 30	0 54.0	329 26	21 57.7	0.9349	1.3008	4.41	0.6446
	23	0.0641	1.309	0.017	13 42	0 54.8	328 27	21 53.8	0.9372	1.3002	4.53	0.6563
	24	0.0668	1.318	0.016	13 44	0 54.9	327 28	21 49.9	0.9407	1.2996	4.65	0.6676
	25	0.0696	+1.327	−0.013	13 47	0 55.1	326 29	21 45.9	+0.9451	+1.2990	−4.77	−0.6785
	26	0.0723	1.336	0.008	13 43	0 54.9	325 30	21 42.0	0.9495	1.2984	4.89	0.6889
	27	0.0750	1.345	−0.002	13 34	0 54.3	324 30	21 38.0	0.9540	1.2978	5.00	0.6990
	28	0.0778	1.354	+0.005	13 18	0 53.2	323 31	21 34.1	0.9585	1.2971	5.11	0.7088
	29	0.0805	1.363	0.010	12 51	0 51.4	322 31	21 30.1	0.9622	1.2965	5.22	0.7181
	30	0.0832	+1.372	+0.011	12 28	0 49.9	321 31	21 26.1	+0.9648	+1.2958	−5.33	−0.7272
	31	0.0860	1.381	0.011	12 1	0 48.1	320 31	21 22.1	0.9668	1.2952	5.44	0.7359
Feb.	1	0.0887	1.390	0.006	11 45	0 47.0	319 31	21 18.1	0.9677	1.2945	5.55	0.7443
	2	0.0914	1.398	+0.001	11 32	0 46.1	318 30	21 14.0	0.9685	1.2939	5.65	0.7524
h	3	0.0942	1.407	−0.004	11 31	0 46.1	317 30	21 10.0	0.9605	1.2932	5.76	0.7603
(9.0)	4	0.0969	+1.415	−0.008	11 29	0 45.9	316 29	21 5.9	+0.970	+1.2926	−5.86	−0.7678
	5	0.0997	1.423	0.009	11 36	0 46.4	315 28	21 1.9	0.9730	1.2919	5.96	0.7751
	6	0.1024	1.431	0.008	11 42	0 46.8	314 27	20 57.8	0.9761	1.2912	6.05	0.7821
	7	0.1051	1.439	−0.003	11 51	0 47.4	313 26	20 53.7	0.9801	1.2906	6.15	0.7889
	8	0.1079	1.447	+0.002	11 48	0 47.2	312 25	20 49.7	0.9840	1.2899	6.24	0.7955
	9	0.1106	+1.455	+0.006	11 38	0 46.5	311 23	20 45.5	+0.9875	+1.2892	−6.34	−0.8018
	10	0.1134	1.463	0.011	11 25	0 45.7	310 21	20 41.4	0.9911	1.2886	6.43	0.8079
	11	0.1161	1.470	0.015	11 10	0 44.7	309 20	20 37.3	0.9937	1.2880	6.51	0.8137
	12	0.1188	1.478	0.014	10 54	0 43.6	308 18	20 33.2	0.9953	1.2873	6.60	0.8194
	13	0.1216	1.486	0.011	10 35	0 42.3	307 16	20 29.1	0.9963	1.2867	6.68	0.8248
	14	0.1243	+1.493	+0.008	10 19	0 41.3	306 14	20 24.9	+0.9972	+1.2860	−6.76	−0.8301
	15	0.1270	+1.500	+0.004	10 8	0 40.5	305 11	20 20.7	+0.9976	+1.2854	−6.84	−0.8351

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
				In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Feb. 15	0.1270	+1.500	+0.004	10 8	0 40.5	305 11	20 20.7	+0.9976	+1.2854	−6.84	−0.8351
16	0.1298	1.507	−0.003	10 1	0 40.1	304 8	20 16.5	0.9976	1.2848	6.92	0.8400
17	0.1325	1.514	0.009	9 58	0 39.9	303 6	20 12.4	0.9976	1.2842	6.99	0.8446
h 18	0.1353	1.521	0.013	10 0	0 40.0	302 3	20 8.2	0.9985	1.2836	7.06	0.8491
(10.0) 19	0.1380	1.528	0.016	10 5	0 40.3	301 0	20 4.0	0.9999	1.2830	7.14	0.8534
20	0.1407	+1.535	−0.016	10 12	0 40.8	299 57	19 59.8	+1.0021	+1.2824	−7.20	−0.8576
21	0.1435	1.541	0.013	10 19	0 41.3	298 53	19 55.5	1.0047	1.2818	7.27	0.8615
22	0.1462	1.548	0.010	10 21	0 41.4	297 50	19 51.3	1.0077	1.2813	7.33	0.8653
23	0.1490	1.555	−0.005	10 20	0 41.3	296 46	19 47.1	1.0112	1.2808	7.39	0.8689
24	0.1517	1.561	+0.002	10 8	0 40.5	295 42	19 42.8	1.0144	1.2802	7.45	0.8723
25	0.1544	+1.567	+0.007	9 58	0 39.9	294 39	19 38.6	+1.0174	+1.2797	−7.51	−0.8756
26	0.1572	1.574	0.009	9 44	0 38.9	293 35	19 34.3	1.0196	1.2792	7.56	0.8788
27	0.1599	1.580	0.009	9 26	0 37.7	292 31	19 30.1	1.0208	1.2788	7.62	0.8817
28	0.1626	1.586	0.007	9 5	0 36.3	291 26	19 25.7	1.0215	1.2783	7.67	0.8845
Mar. 1	0.1654	1.592	+0.003	8 58	0 35.9	290 22	19 21.5	1.0218	1.2779	7.71	0.8872
2	0.1681	+1.598	−0.002	8 55	0 35.7	289 18	19 17.2	+1.0220	+1.2775	−7.76	−0.8897
3	0.1708	1.604	0.007	9 1	0 36.1	288 13	19 12.9	1.0225	1.2771	7.80	0.8921
4	0.1736	1.610	0.009	9 12	0 36.8	287 9	19 8.6	1.0237	1.2767	7.84	0.8943
5	0.1763	1.616	0.010	9 20	0 37.3	286 4	19 4.3	1.0255	1.2763	7.88	0.8964
h 6	0.1791	1.622	0.008	9 30	0 38.0	284 59	18 59.9	1.0277	1.2760	7.91	0.8983
(11.0) 7	0.1818	+1.628	−0.005	9 37	0 38.5	283 54	18 55.6	+1.0303	+1.2757	−7.94	−0.9001
8	0.1845	1.634	+0.002	9 36	0 38.4	282 50	18 51.3	1.0335	1.2754	7.98	0.9018
9	0.1873	1.640	0.007	9 29	0 37.9	281 45	18 47.0	1.0363	1.2751	8.00	0.9033
10	0.1900	1.646	0.010	9 22	0 37.5	280 40	18 42.7	1.0386	1.2749	8.03	0.9046
11	0.1928	1.651	0.014	9 10	0 36.7	279 35	18 38.3	1.0408	1.2746	8.06	0.9062
12	0.1955	+1.657	+0.013	8 56	0 35.7	278 30	18 34.0	+1.0419	+1.2744	−8.08	−0.9072
13	0.1982	1.662	0.010	8 49	0 35.3	277 25	18 29.7	1.0421	1.2742	8.09	0.9080
14	0.2010	1.668	+0.004	8 40	0 34.7	276 20	18 25.3	1.0419	1.2741	8.11	0.9088
15	0.2037	1.673	−0.001	8 37	0 34.5	275 15	18 21.0	1.0419	1.2740	8.12	0.9095
16	0.2064	1.679	0.007	8 40	0 34.7	274 10	18 16.7	1.0421	1.2739	8.13	0.9101
17	0.2092	+1.685	−0.012	8 46	0 35.1	273 5	18 12.3	+1.0423	+1.2738	−8.14	−0.9105
18	0.2119	1.690	0.015	8 54	0 35.6	272 0	18 8.0	1.0433	1.2737	8.14	0.9108
19	0.2147	1.696	0.016	9 5	0 36.3	270 55	18 3.7	1.0446	1.2737	8.15	0.9110
20	0.2174	1.701	0.015	9 19	0 37.3	269 50	17 59.3	1.0464	1.2737	8.15	0.9110
h 21	0.2201	1.707	0.012	9 28	0 37.9	268 45	17 55.0	1.0491	1.2737	8.15	0.9109
(12.0) 22	0.2229	+1.713	−0.007	9 33	0 38.2	267 41	17 50.7	+1.0520	+1.2737	−8.14	−0.9107
23	0.2256	1.718	−0.002	9 33	0 38.2	266 36	17 46.4	1.0547	1.2738	8.13	0.9104
24	0.2284	1.724	+0.003	9 26	0 37.7	265 31	17 42.1	1.0572	1.2739	8.13	0.9099
25	0.2311	1.729	0.009	9 14	0 36.9	264 26	17 37.7	1.0596	1.2740	8.12	0.9093
26	0.2338	1.735	0.008	9 3	0 36.2	263 22	17 33.5	1.0607	1.2741	8.10	0.9086
27	0.2366	+1.741	+0.007	8 56	0 35.7	262 17	17 29.1	+1.0618	+1.2743	−8.08	−0.9077
28	0.2393	1.746	+0.003	8 50	0 35.3	261 13	17 24.9	1.0619	1.2745	8.07	0.9067
29	0.2420	1.752	−0.003	8 50	0 35.3	260 9	17 20.6	1.0619	1.2747	8.05	0.9056
30	0.2448	1.757	0.007	8 58	0 35.9	259 4	17 16.3	1.0622	1.2749	8.02	0.9043
31	0.2475	1.763	0.011	9 9	0 36.6	258 0	17 12.0	1.0630	1.2752	8.00	0.9029
Apr. 1	0.2502	+1.769	−0.011	9 22	0 37.5	256 56	17 7.7	+1.0646	+1.2754	−7.97	−0.9014
2	0.2530	+1.774	−0.008	9 37	0 38.5	255 52	17 3.5	+1.0671	+1.2757	−7.94	−0.8998

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f	f′	G		H		Log g.	Log k.	i	Log i.
				In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Apr. 1	0.2502	+1.769	−0.011	9 22	0 37.5	256 56	17 7.7	+1.0646	+1.2754	−7.97	−0.9014
2	0.2530	1.774	0.008	9 37	0 38.5	255 52	17 3.5	1.0671	1.2757	7.94	0.8998
3	0.2557	1.780	−0.003	9 51	0 39.4	254 48	16 59.2	1.0700	1.2760	7.91	0.8980
4	0.2585	1.786	+0.003	9 53	0 39.5	253 45	16 55.0	1.0729	1.2764	7.87	0.8961
5	0.2612	1.792	0.009	9 55	0 39.7	252 41	16 50.7	1.0758	1.2767	7.83	0.8940
h (13.0) 6	0.2639	+1.798	+0.014	9 54	0 39.6	251 38	16 46.5	+1.0784	+1.2771	−7.79	−0.8918
7	0.2667	1.804	0.015	9 49	0 39.3	250 35	16 42.3	1.0800	1.2775	7.75	0.8895
8	0.2694	1.810	0.015	9 41	0 38.7	249 32	16 38.1	1.0813	1.2779	7.71	0.8870
9	0.2722	1.816	0.012	9 38	0 38.5	248 29	16 33.9	1.0821	1.2783	7.66	0.8844
10	0.2749	1.822	0.008	9 34	0 38.3	247 26	16 29.7	1.0823	1.2788	7.61	0.8816
11	0.2776	+1.828	+0.003	9 34	0 38.3	246 24	16 25.6	+1.0827	+1.2793	−7.56	−0.8787
12	0.2804	1.834	−0.002	9 39	0 38.6	245 21	16 21.4	1.0829	1.2797	7.51	0.8757
13	0.2831	1.841	0.008	9 48	0 39.2	244 19	16 17.3	1.0833	1.2801	7.46	0.8725
14	0.2858	1.847	0.012	9 58	0 39.9	243 17	16 13.1	1.0841	1.2807	7.40	0.8691
15	0.2886	1.854	0.014	10 10	0 40.7	242 15	16 9.0	1.0856	1.2813	7.34	0.8656
16	0.2913	+1.860	−0.014	10 28	0 41.9	241 13	16 4.9	+1.0875	+1.2818	−7.28	−0.8619
17	0.2941	1.867	0.013	10 41	0 42.7	240 12	16 0.8	1.0896	1.2823	7.21	0.8581
18	0.2968	1.873	0.007	10 51	0 43.4	239 11	15 56.7	1.0925	1.2829	7.15	0.8542
19	0.2995	1.880	−0.002	10 59	0 43.9	238 10	15 52.7	1.0954	1.2834	7.08	0.8500
20	0.3023	1.887	+0.003	10 57	0 43.8	237 9	15 48.6	1.0983	1.2840	7.01	0.8457
h (14.0) 21	0.3050	+1.894	+0.007	10 53	0 43.5	236 8	15 44.5	+1.1008	+1.2846	−6.94	−0.8413
22	0.3077	1.901	0.009	10 47	0 43.1	235 8	15 40.5	1.1027	1.2852	6.87	0.8367
23	0.3105	1.908	0.007	10 37	0 42.5	234 7	15 36.5	1.1036	1.2858	6.79	0.8319
24	0.3132	1.915	+0.004	10 33	0 42.2	233 7	15 32.5	1.1044	1.2864	6.71	0.8269
25	0.3160	1.923	−0.002	10 35	0 42.3	232 7	15 28.5	1.1049	1.2870	6.63	0.8217
26	0.3187	+1.930	−0.008	10 43	0 42.9	231 7	15 24.5	+1.1054	+1.2877	−6.55	−0.8163
27	0.3214	1.938	0.012	10 55	0 43.7	230 8	15 20.5	1.1066	1.2883	6.47	0.8108
28	0.3242	1.945	0.013	11 11	0 44.7	229 9	15 16.6	1.1084	1.2889	6.38	0.8051
29	0.3269	1.952	0.010	11 25	0 45.7	228 10	15 12.7	1.1109	1.2895	6.30	0.7991
30	0.3297	1.960	0.006	11 38	0 46.5	227 11	15 8.7	1.1140	1.2902	6.21	0.7929
May 1	0.3324	+1.968	−0.001	11 48	0 47.2	226 12	15 4.8	+1.1172	+1.2908	−6.12	−0.7866
2	0.3351	1.976	+0.006	11 46	0 47.1	225 14	15 0.9	1.1203	1.2914	6.03	0.7800
3	0.3379	1.984	0.010	11 44	0 46.9	224 15	14 57.0	1.1230	1.2921	5.93	0.7732
4	0.3406	1.992	0.013	11 43	0 46.9	223 17	14 53.1	1.1253	1.2927	5.84	0.7662
5	0.3433	2.000	0.014	11 38	0 46.5	222 19	14 49.3	1.1270	1.2933	5.74	0.7589
h 6	0.3461	+2.008	+0.012	11 33	0 46.2	221 21	14 45.4	+1.1281	+1.2940	−5.64	−0.7514
(15.0) 7	0.3488	2.016	0.008	11 32	0 46.1	220 24	14 41.6	1.1290	1.2946	5.54	0.7437
8	0.3516	2.024	+0.005	11 33	0 46.2	219 26	14 37.7	1.1300	1.2952	5.44	0.7356
9	0.3543	2.032	−0.001	11 35	0 46.3	218 29	14 33.9	1.1305	1.2958	5.34	0.7273
10	0.3570	2.041	0.007	11 41	0 46.7	217 32	14 30.1	1.1313	1.2964	5.23	0.7187
11	0.3598	+2.050	−0.012	11 52	0 47.5	216 35	14 26.3	+1.1325	+1.2970	−5.13	−0.7099
12	0.3625	2.059	0.014	12 5	0 48.3	215 39	14 22.6	1.1342	1.2977	5.02	0.7007
13	0.3652	2.067	0.014	12 16	0 49.1	214 42	14 18.8	1.1363	1.2983	4.91	0.6912
14	0.3680	2.076	0.012	12 27	0 49.8	213 46	14 15.1	1.1389	1.2988	4.80	0.6813
15	0.3707	2.085	0.008	12 37	0 50.5	212 50	14 11.3	1.1419	1.2994	4.69	0.6711
16	0.3735	+2.094	−0.003	12 42	0 50.8	211 54	14 7.6	+1.1450	+1.3000	−4.58	−0.6606
17	0.3762	+2.103	+0.002	12 42	0 50.8	210 59	14 3.9	+1.1481	+1.3005	−4.46	−0.6496

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f	f′	G		H		Log g.	Log k.	i	Log i.
				In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
May 17	0.3762	+2.103	+0.002	12 42	0 50.8	210 59	14 3.9	+1.1481	+1.3005	−4.46	−0.6496
18	0.3789	2.112	0.006	12 37	0 50.5	210 3	14 0.2	1.1505	1.3011	4.35	0.6383
19	0.3817	2.121	0.008	12 29	0 49.9	209 8	13 56.5	1.1526	1.3016	4.23	0.6265
20	0.3844	2.130	0.009	12 21	0 49.4	208 12	13 52.8	1.1544	1.3022	4.11	0.6142
21	0.3871	2.139	0.006	12 14	0 48.9	207 17	13 49.1	1.1555	1.3027	3.99	0.6015
h (16.0) 22	0.3899	+2.148	+0.001	12 13	0 48.9	206 23	13 45.5	+1.1561	+1.3032	−3.88	−0.5884
23	0.3926	2.158	−0.005	12 16	0 49.1	205 28	13 41.9	1.1571	1.3037	3.76	0.5747
24	0.3954	2.167	0.009	12 24	0 49.6	204 33	13 38.2	1.1582	1.3042	3.63	0.5603
25	0.3981	2.177	0.011	12 35	0 50.3	203 39	13 34.6	1.1601	1.3046	3.51	0.5453
26	0.4008	2.187	0.011	12 48	0 51.2	202 44	13 30.9	1.1624	1.3051	3.39	0.5297
27	0.4036	+2.197	−0.008	12 57	0 51.8	201 50	13 27.3	+1.1653	+1.3055	−3.26	−0.5135
28	0.4063	2.206	−0.002	13 3	0 52.2	200 56	13 23.7	1.1687	1.3060	3.14	0.4965
29	0.4091	2.216	+0.003	13 5	0 52.3	200 2	13 20.1	1.1717	1.3064	3.01	0.4787
30	0.4118	2.226	0.008	13 4	0 52.3	199 8	13 16.5	1.1745	1.3068	2.88	0.4599
31	0.4145	2.236	0.011	13 0	0 52.0	198 14	13 12.9	1.1771	1.3071	2.76	0.4402
June 1	0.4173	+2.246	+0.013	12 51	0 51.4	197 20	13 9.3	+1.1790	+1.3075	−2.63	−0.4195
2	0.4200	2.256	0.012	12 44	0 50.9	196 27	13 5.8	1.1805	1.3078	2.50	0.3976
3	0.4227	2.266	0.009	12 39	0 50.6	195 34	13 2.3	1.1817	1.3082	2.37	0.3744
4	0.4255	2.276	+0.005	12 38	0 50.5	194 40	12 58.7	1.1827	1.3085	2.24	0.3498
5	0.4282	2.286	0.000	12 38	0 50.5	193 47	12 55.1	1.1838	1.3088	2.11	0.3235
h (17.0) 6	0.4310	+2.296	−0.004	12 38	0 50.5	192 54	12 51.6	+1.1849	+1.3091	−1.97	−0.2955
7	0.4337	2.306	0.009	12 43	0 50.9	192 1	12 48.1	1.1860	1.3093	1.84	0.2654
8	0.4364	2.317	0.013	12 48	0 51.2	191 8	12 44.5	1.1874	1.3096	1.71	0.2330
9	0.4392	2.327	0.015	12 56	0 51.7	190 15	12 41.0	1.1894	1.3098	1.58	0.1975
10	0.4419	2.337	0.013	13 5	0 52.3	189 22	12 37.5	1.1918	1.3100	1.44	0.1590
11	0.4446	+2.347	−0.009	13 9	0 52.6	188 29	12 33.9	+1.1944	+1.3102	−1.31	−0.1167
12	0.4474	2.358	−0.004	13 12	0 52.8	187 36	12 30.4	1.1974	1.3104	1.17	0.0697
13	0.4501	2.368	+0.002	13 9	0 52.6	186 44	12 26.9	1.2003	1.3105	1.04	0.0169
14	0.4529	2.379	0.007	13 4	0 52.3	185 51	12 23.4	1.2030	1.3107	0.91	9.9567
15	0.4556	2.389	0.011	12 56	0 51.7	184 58	12 19.9	1.2053	1.3108	0.77	9.8864
16	0.4583	+2.399	+0.012	12 46	0 51.1	184 6	12 16.4	+1.2071	+1.3109	−0.63	−9.8025
17	0.4611	2.410	0.009	12 37	0 50.5	183 13	12 12.9	1.2083	1.3110	0.50	9.6983
18	0.4638	2.420	+0.005	12 29	0 49.9	182 20	12 9.3	1.2092	1.3110	0.36	9.5608
19	0.4665	2.431	−0.001	12 28	0 49.9	181 28	12 5.9	1.2100	1.3111	0.23	9.3583
20	0.4693	2.441	0.006	12 30	0 50.0	180 35	12 2.3	1.2110	1.3111	−0.09	−8.9664
h (18.0) 21	0.4720	+2.451	−0.009	12 36	0 50.4	179 43	11 58.9	+1.2126	+1.3111	+0.04	+8.6345
22	0.4748	2.462	0.011	12 44	0 50.9	178 50	11 55.3	1.2143	1.3111	0.18	9.2522
23	0.4775	2.472	0.008	12 48	0 51.2	177 58	11 51.9	1.2167	1.3111	0.31	9.4976
24	0.4802	2.483	−0.003	12 54	0 51.6	177 6	11 48.4	1.2196	1.3110	0.45	9.6530
25	0.4830	2.493	+0.003	12 55	0 51.7	176 13	11 44.9	1.2224	1.3109	0.59	9.7673
26	0.4857	+2.503	+0.010	12 50	0 51.3	175 20	11 41.3	+1.2252	+1.3108	+0.72	+9.8576
27	0.4885	2.514	0.013	12 44	0 50.9	174 28	11 37.9	1.2275	1.3107	0.86	9.9324
28	0.4912	2.524	0.015	12 34	0 50.3	173 35	11 34.3	1.2293	1.3106	0.99	9.9957
29	0.4939	2.535	0.014	12 25	0 49.7	172 42	11 30.8	1.2308	1.3104	1.12	0.0510
30	0.4967	2.545	0.012	12 15	0 49.0	171 50	11 27.3	1.2318	1.3103	1.26	0.0999
July 1	0.4994	+2.555	+0.007	12 10	0 48.7	170 57	11 23.8	+1.2326	+1.3101	+1.39	+0.1436
2	0.5021	+2.566	+0.001	12 7	0 48.5	170 4	11 20.3	+1.2333	+1.3099	+1.53	+0.1833

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
				In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
July 1	0.4994	+2.555	+0.007	12 10	0 48.7	170 57	11 23.8	+1.2326	+1.3101	+1.39	+0.1436
2	0.5021	2.566	+0.001	12 7	0 48.5	170 4	11 20.3	1.2333	1.3099	1.53	0.1833
3	0.5049	2.576	−0.004	12 5	0 48.3	169 12	11 16.8	1.2341	1.3097	1.66	0.2196
4	0.5076	2.586	0.008	12 6	0 48.4	168 19	11 13.3	1.2351	1.3094	1.79	0.2530
h 5	0.5104	2.596	0.011	12 7	0 48.5	167 26	11 9.7	1.2364	1.3092	1.92	0.2839
(19.0) 6	0.5131	+2.606	−0.013	12 11	0 48.7	166 33	11 6.2	+1.2378	+1.3089	+2.05	+0.3126
7	0.5158	2.617	0.014	12 16	0 49.1	165 40	11 2.7	1.2395	1.3086	2.18	0.3394
8	0.5186	2.627	0.011	12 18	0 49.2	164 47	10 59.1	1.2418	1.3083	2.32	0.3646
9	0.5213	2.637	0.006	12 18	0 49.2	163 54	10 55.6	1.2442	1.3080	2.45	0.3883
10	0.5240	2.647	−0.001	12 16	0 49.1	163 0	10 52.0	1.2466	1.3076	2.57	0.4106
11	0.5268	+2.657	+0.005	12 10	0 48.7	162 7	10 48.5	+1.2491	+1.3073	+2.70	+0.4317
12	0.5295	2.666	0.009	12 1	0 48.1	161 13	10 44.9	1.2510	1.3069	2.83	0.4517
13	0.5323	2.676	0.011	11 48	0 47.2	160 20	10 41.3	1.2526	1.3065	2.96	0.4708
14	0.5350	2.686	0.011	11 36	0 46.4	159 26	10 37.7	1.2539	1.3061	3.08	0.4889
15	0.5377	2.696	0.007	11 28	0 45.9	158 32	10 34.1	1.2546	1.3057	3.21	0.5062
16	0.5405	+2.706	+0.002	11 22	0 45.5	157 39	10 30.6	+1.2553	+1.3053	+3.33	+0.5227
17	0.5432	2.715	−0.001	11 21	0 45.4	156 45	10 27.0	1.2562	1.3048	3.46	0.5385
18	0.5459	2.725	0.006	11 21	0 45.4	155 51	10 23.4	1.2571	1.3044	3.58	0.5536
19	0.5487	2.734	0.009	11 26	0 45.7	154 56	10 19.7	1.2582	1.3039	3.70	0.5681
20	0.5514	2.743	0.006	11 30	0 46.0	154 2	10 16.1	1.2602	1.3034	3.82	0.5820
h 21	0.5542	+2.753	−0.003	11 32	0 46.1	153 7	10 12.5	+1.2624	+1.3029	+3.94	+0.5954
(20.0) 22	0.5569	2.762	+0.002	11 31	0 46.1	152 13	10 8.9	1.2645	1.3024	4.06	0.6082
23	0.5596	2.772	0.007	11 26	0 45.7	151 18	10 5.2	1.2666	1.3019	4.17	0.6206
24	0.5624	2.781	0.012	11 20	0 45.3	150 23	10 1.5	1.2688	1.3014	4.29	0.6325
25	0.5651	2.790	0.013	11 12	0 44.8	149 28	9 57.9	1.2701	1.3008	4.41	0.6440
26	0.5679	+2.799	+0.014	11 3	0 44.2	148 33	9 54.2	+1.2714	+1.3003	+4.52	+0.6551
27	0.5706	2.807	0.013	10 52	0 43.5	147 37	9 50.5	1.2723	1.2997	4.63	0.6657
28	0.5733	2.816	0.010	10 44	0 42.9	146 42	9 46.8	1.2730	1.2991	4.74	0.6760
29	0.5761	2.825	+0.004	10 38	0 42.5	145 46	9 43.1	1.2732	1.2986	4.85	0.6860
30	0.5788	2.834	−0.002	10 35	0 42.3	144 50	9 39.3	1.2737	1.2980	4.96	0.6956
31	0.5815	+2.842	−0.007	10 34	0 42.3	143 54	9 35.6	+1.2741	+1.2974	+5.07	+0.7049
Aug. 1	0.5843	2.851	0.011	10 35	0 42.3	142 58	9 31.9	1.2749	1.2968	5.17	0.7139
2	0.5870	2.859	0.013	10 36	0 42.4	142 2	9 28.1	1.2758	1.2962	5.28	0.7225
3	0.5898	2.868	0.014	10 38	0 42.5	141 5	9 24.3	1.2770	1.2956	5.38	0.7309
4	0.5925	2.876	0.013	10 41	0 42.7	140 8	9 20.5	1.2786	1.2950	5.48	0.7391
h 5	0.5952	+2.884	−0.008	10 42	0 42.8	139 11	9 16.7	+1.2805	+1.2943	+5.58	+0.7469
(21.0) 6	0.5980	2.892	−0.003	10 39	0 42.6	138 14	9 12.9	1.2824	1.2937	5.68	0.7545
7	0.6007	2.900	+0.003	10 32	0 42.1	137 17	9 9.1	1.2844	1.2931	5.78	0.7618
8	0.6034	2.908	0.007	10 24	0 41.6	136 20	9 5.3	1.2860	1.2925	5.87	0.7689
9	0.6062	2.916	0.009	10 15	0 41.0	135 22	9 1.5	1.2873	1.2918	5.97	0.7758
10	0.6089	+2.923	+0.011	10 5	0 40.3	134 24	8 57.6	+1.2883	+1.2912	+6.06	+0.7825
11	0.6117	2.931	0.007	9 55	0 39.7	133 26	8 53.7	1.2887	1.2906	6.15	0.7889
12	0.6144	2.938	+0.003	9 48	0 39.2	132 28	8 49.9	1.2890	1.2900	6.24	0.7951
13	0.6171	2.946	−0.002	9 46	0 39.1	131 30	8 46.0	1.2893	1.2893	6.33	0.8011
14	0.6199	2.953	0.006	9 47	0 39.1	130 31	8 42.1	1.2899	1.2887	6.41	0.8069
15	0.6226	+2.960	−0.008	9 51	0 39.4	129 33	8 38.2	+1.2906	+1.2881	+6.50	+0.8126
16	0.6253	+2.968	−0.009	9 55	0 39.7	128 34	8 34.3	+1.2917	+1.2875	+6.58	+0.8180

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
					In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Aug.	16	0.6253	+2.968	−0.009	9 55	0 39.7	128 34	8 34.3	+1.2917	+1.2875	+6.58	+0.8180
	17	0.6281	2.975	0.007	9 58	0 39.9	127 34	8 30.3	1.2931	1.2869	6.66	0.8232
	18	0.6308	2.982	−0.003	9 59	0 39.9	126 35	8 26.3	1.2948	1.2863	6.73	0.8283
	19	0.6336	2.989	+0.002	9 57	0 39.8	125 36	8 22.4	1.2966	1.2856	6.81	0.8332
h	20	0.6363	2.996	0.008	9 53	0 39.5	124 36	8 18.4	1.2983	1.2851	6.88	0.8379
(22.0)	21	0.6390	+3.002	+0.013	9 45	0 39.0	123 36	8 14.4	+1.2998	+1.2845	+6.96	+0.8424
	22	0.6418	3.009	0.015	9 35	0 38.3	122 36	8 10.4	1.3009	1.2839	7.03	0.8468
	23	0.6445	3.016	0.014	9 26	0 37.7	121 36	8 6.4	1.3015	1.2833	7.10	0.8510
	24	0.6473	3.022	0.011	9 18	0 37.2	120 35	8 2.3	1.3019	1.2828	7.16	0.8550
	25	0.6500	3.029	+0.006	9 15	0 37.0	119 35	7 58.3	1.3020	1.2822	7.23	0.8589
	26	0.6527	+3.035	0.000	9 11	0 36.7	118 34	7 54.3	+1.3020	+1.2817	+7.29	+0.8627
	27	0.6555	3.042	−0.007	9 9	0 36.6	117 33	7 50.2	1.3020	1.2812	7.35	0.8662
	28	0.6582	3.048	0.010	9 11	0 36.7	116 32	7 46.1	1.3024	1.2806	7.41	0.8697
	29	0.6609	3.054	0.012	9 15	0 37.0	115 30	7 42.0	1.3030	1.2801	7.46	0.8730
	30	0.6637	3.060	0.013	9 19	0 37.3	114 29	7 37.9	1.3038	1.2797	7.52	0.8761
	31	0.6664	+3.067	−0.013	9 25	0 37.7	113 27	7 33.8	+1.3050	+1.2792	+7.57	+0.8791
Sept.	1	0.6692	3.073	0.010	9 26	0 37.7	112 26	7 29.7	1.3062	1.2787	7.62	0.8819
	2	0.6719	3.079	−0.005	9 26	0 37.7	111 24	7 25.6	1.3077	1.2783	7.67	0.8846
	3	0.6746	3.085	0.000	9 24	0 37.6	110 22	7 21.5	1.3093	1.2779	7.71	0.8872
h	4	0.6774	3.091	+0.004	9 19	0 37.3	109 19	7 17.3	1.3106	1.2775	7.76	0.8897
(23.0)	5	0.6801	+3.097	+0.007	9 11	0 36.7	108 17	7 13.1	+1.3117	+1.2771	+7.80	+0.8920
	6	0.6828	3.102	0.009	9 1	0 36.1	107 14	7 8.9	1.3126	1.2767	7.84	0.8941
	7	0.6856	3.108	0.008	8 54	0 35.6	106 12	7 4.8	1.3132	1.2764	7.87	0.8961
	8	0.6883	3.114	+0.005	8 48	0 35.2	105 9	7 0.6	1.3133	1.2760	7.91	0.8980
	9	0.6910	3.119	−0.001	8 47	0 35.1	104 6	6 56.4	1.3132	1.2757	7.94	0.8998
	10	0.6938	+3.125	−0.006	8 48	0 35.2	103 3	6 52.2	+1.3134	+1.2754	+7.97	+0.9014
	11	0.6965	3.130	0.008	8 53	0 35.5	102 0	6 48.0	1.3139	1.2752	8.00	0.9029
	12	0.6993	3.136	0.009	8 59	0 35.9	100 56	6 43.7	1.3148	1.2749	8.02	0.9043
	13	0.7020	3.142	0.007	9 5	0 36.3	99 53	6 39.5	1.3160	1.2747	8.05	0.9056
	14	0.7047	3.147	−0.001	9 10	0 36.7	98 50	6 35.3	1.3176	1.2745	8.07	0.9067
	15	0.7075	+3.153	+0.004	9 11	0 36.7	97 46	6 31.1	+1.3191	+1.2743	+8.09	+0.9077
	16	0.7102	3.158	0.010	9 8	0 36.5	96 42	6 26.8	1.3205	1.2742	8.10	0.9085
	17	0.7130	3.164	0.014	9 5	0 36.3	95 38	6 22.5	1.3219	1.2740	8.11	0.9092
	18	0.7157	3.169	0.016	8 59	0 35.9	94 35	6 18.3	1.3227	1.2739	8.12	0.9098
	19	0.7184	3.175	0.015	8 53	0 35.5	93 31	6 14.1	1.3232	1.2738	8.13	0.9103
h	20	0.7212	+3.180	+0.013	8 49	0 35.3	92 27	6 9.8	+1.3236	+1.2737	+8.14	+0.9107
(0.0)	21	0.7239	3.186	0.008	8 48	0 35.2	91 23	6 5.5	1.3235	1.2737	8.15	0.9109
	22	0.7266	3.191	+0.003	8 46	0 35.1	90 19	6 1.3	1.3236	1.2737	8.15	0.9110
	23	0.7294	3.196	−0.002	8 46	0 35.1	89 15	5 57.0	1.3236	1.2737	8.15	0.9110
	24	0.7321	3.202	0.008	8 49	0 35.3	88 11	5 52.7	1.3237	1.2737	8.15	0.9109
	25	0.7349	+3.207	−0.012	8 54	0 35.6	87 6	5 48.4	+1.3239	+1.2738	+8.14	+0.9106
	26	0.7376	3.213	0.014	9 0	0 36.0	86 2	5 44.1	1.3245	1.2738	8.13	0.9102
	27	0.7403	3.218	0.014	9 7	0 36.5	84 58	5 39.9	1.3254	1.2739	8.12	0.9096
	28	0.7431	3.223	0.011	9 12	0 36.8	83 54	5 35.6	1.3265	1.2741	8.11	0.9090
	29	0.7458	3.229	0.008	9 17	0 37.1	82 50	5 31.3	1.3279	1.2742	8.10	0.9082
	30	0.7486	+3.234	−0.002	9 18	0 37.2	81 46	5 27.1	+1.3294	+1.2744	+8.08	+0.9072
Oct.	1	0.7513	+3.240	+0.002	9 16	0 37.1	80 41	5 22.7	+1.3307	+1.2746	+8.06	+0.9062

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
					In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Oct.	1	0.7513	+3.240	+0.002	9 16	0 37.1	80 41	5 22.7	+1.3307	+1.2746	+8.06	+0.9062
	2	0.7540	3.245	0.006	9 12	0 36.8	79 37	5 18.5	1.3318	1.2748	8.04	0.9050
	3	0.7568	3.251	0.007	9 7	0 36.5	78 33	5 14.2	1.3326	1.2750	8.01	0.9037
	4	0.7595	3.256	0.006	9 2	0 36.1	77 29	5 9.9	1.3332	1.2753	7.98	0.9022
h	5	0.7622	3.262	+0.003	8 58	0 35.9	76 25	5 5.7	1.3334	1.2756	7.95	0.9006
(1.0)	6	0.7650	+3.267	−0.001	8 56	0 35.7	75 21	5 1.4	+1.3336	+1.2759	+7.92	+0.8989
	7	0.7677	3.273	0.006	8 59	0 35.9	74 17	4 57.1	1.3338	1.2762	7.89	0.8971
	8	0.7705	3.279	0.010	9 5	0 36.3	73 14	4 52.9	1.3342	1.2766	7.85	0.8951
	9	0.7732	3.285	0.011	9 12	0 36.8	72 10	4 48.7	1.3349	1.2769	7.81	0.8929
	10	0.7759	3.290	0.010	9 22	0 37.5	71 6	4 44.4	1.3360	1.2773	7.77	0.8906
	11	0.7787	+3.296	−0.005	9 30	0 38.0	70 3	4 40.2	+1.3376	+1.2777	+7.73	+0.8882
	12	0.7814	3.302	+0.001	9 34	0 38.3	68 59	4 35.9	1.3393	1.2781	7.68	0.8856
	13	0.7841	3.308	0.007	9 37	0 38.5	67 56	4 31.7	1.3409	1.2786	7.64	0.8829
	14	0.7869	3.314	0.013	9 36	0 38.4	66 53	4 27.5	1.3424	1.2790	7.59	0.8800
	15	0.7896	3.320	0.016	9 33	0 38.2	65 49	4 23.3	1.3436	1.2795	7.53	0.8770
	16	0.7924	+3.327	+0.015	9 29	0 37.9	64 46	4 19.1	+1.3443	+1.2800	+7.48	+0.8738
	17	0.7951	3.333	0.014	9 25	0 37.7	63 43	4 14.9	1.3448	1.2805	7.42	0.8705
	18	0.7978	3.339	0.010	9 25	0 37.7	62 40	4 10.7	1.3451	1.2810	7.36	0.8670
	19	0.8006	3.346	+0.004	9 26	0 37.7	61 38	4 6.5	1.3452	1.2816	7.30	0.8633
h	20	0.8033	3.352	−0.001	9 29	0 37.9	60 35	4 2.3	1.3455	1.2821	7.24	0.8595
(2.0)	21	0.8060	+3.359	−0.006	9 32	0 38.1	59 32	3 58.1	+1.3457	+1.2827	+7.17	+0.8555
	22	0.8088	3.365	0.010	9 38	0 38.5	58 30	3 54.0	1.3461	1.2833	7.10	0.8514
	23	0.8115	3.372	0.013	9 46	0 39.1	57 27	3 49.8	1.3467	1.2839	7.03	0.8471
	24	0.8143	3.379	0.014	9 54	0 39.6	56 25	3 45.7	1.3477	1.2844	6.96	0.8425
	25	0.8170	3.385	0.012	10 3	0 40.2	55 23	3 41.5	1.3490	1.2851	6.88	0.8378
	26	0.8197	+3.392	−0.009	10 9	0 40.6	54 21	3 37.4	+1.3505	+1.2857	+6.81	+0.8329
	27	0.8225	3.399	−0.004	10 13	0 40.9	53 20	3 33.3	1.3520	1.2863	6.73	0.8279
	28	0.8252	3.406	+0.002	10 14	0 40.9	52 18	3 29.2	1.3537	1.2869	6.65	0.8226
	29	0.8280	3.413	0.007	10 12	0 40.8	51 17	3 25.1	1.3551	1.2876	6.56	0.8171
	30	0.8307	3.420	0.009	10 9	0 40.6	50 15	3 21.0	1.3562	1.2882	6.48	0.8114
	31	0.8334	+3.428	+0.009	10 4	0 40.3	49 14	3 16.9	+1.3570	+1.2888	+6.39	+0.8056
Nov.	1	0.8362	3.435	0.006	10 2	0 40.1	48 13	3 12.9	1.3576	1.2895	6.30	0.7995
	2	0.8389	3.443	+0.001	10 3	0 40.2	47 12	3 8.8	1.3579	1.2902	6.21	0.7931
	3	0.8416	3.451	−0.005	10 6	0 40.4	46 12	3 4.8	1.3583	1.2908	6.12	0.7865
h	4	0.8444	3.458	0.009	10 11	0 40.7	45 11	3 0.7	1.3588	1.2915	6.02	0.7797
(3.0)	5	0.8471	+3.466	−0.011	10 19	0 41.3	44 11	2 56.7	+1.3597	+1.2921	+5.93	+0.7727
	6	0.8498	3.474	0.010	10 28	0 41.9	43 11	2 52.7	1.3610	1.2928	5.83	0.7654
	7	0.8526	3.482	−0.006	10 36	0 42.4	42 11	2 48.7	1.3627	1.2934	5.73	0.7578
	8	0.8553	3.490	0.000	10 41	0 42.7	41 11	2 44.7	1.3646	1.2941	5.62	0.7499
	9	0.8581	3.499	+0.005	10 44	0 42.9	40 11	2 40.7	1.3665	1.2947	5.52	0.7418
	10	0.8608	+3.507	+0.011	10 44	0 42.9	39 11	2 36.7	+1.3682	+1.2954	+5.41	+0.7334
	11	0.8635	3.515	0.014	10 44	0 42.9	38 12	2 32.8	1.3696	1.2960	5.31	0.7247
	12	0.8663	3.524	0.015	10 41	0 42.7	37 12	2 28.8	1.3707	1.2967	5.20	0.7156
	13	0.8690	3.533	0.014	10 38	0 42.5	36 13	2 24.9	1.3716	1.2973	5.08	0.7062
	14	0.8718	3.541	0.012	10 35	0 42.3	35 14	2 20.9	1.3723	1.2979	4.97	0.6964
	15	0.8745	+3.550	+0.007	10 36	0 42.4	34 15	2 17.0	+1.3728	+1.2985	+4.86	+0.6863
	16	0.8772	+3.559	+0.003	10 38	0 42.5	33 17	2 13.1	+1.3734	+1.2991	+4.74	+0.6758

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log i.
					In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Nov.	16	0.8772	+3.559	+0.003	10 38	0 42.5	33 17	2 13.1	+1.3734	+1.2991	+4.74	+0.6758
	17	0.8800	3.568	−0.003	10 40	0 42.7	32 18	2 9.2	1.3739	1.2997	4.62	0.6649
	18	0.8827	3.577	0.008	10 45	0 43.0	31 20	2 5.3	1.3745	1.3003	4.51	0.6538
h	19	0.8854	3.587	0.012	10 51	0 43.4	30 21	2 1.4	1.3754	1.3009	4.39	0.6420
(4.0)	20	0.8882	3.596	0.012	10 58	0 43.9	29 23	1 57.5	1.3766	1.3015	4.26	0.6296
	21	0.8909	+3.605	−0.011	11 5	0 44.3	28 25	1 53.7	+1.3781	+1.3021	+4.14	+0.6168
	22	0.8937	3.615	0.009	11 11	0 44.7	27 27	1 49.8	1.3796	1.3026	4.01	0.6036
	23	0.8964	3.624	−0.005	11 14	0 44.9	26 29	1 45.9	1.3813	1.3031	3.89	0.5898
	24	0.8991	3.634	0.000	11 15	0 45.0	25 31	1 42.1	1.3830	1.3037	3.76	0.5754
	25	0.9019	3.643	+0.005	11 13	0 44.9	24 34	1 38.3	1.3847	1.3042	3.63	0.5603
	26	0.9046	+3.653	+0.007	11 10	0 44.7	23 36	1 34.4	+1.3861	+1.3047	+3.50	+0.5446
	27	0.9074	3.663	0.007	11 5	0 44.3	22 39	1 30.6	1.3872	1.3051	3.37	0.5281
	28	0.9101	3.673	0.005	11 1	0 44.1	21 42	1 26.8	1.3880	1.3056	3.24	0.5108
	29	0.9128	3.683	+0.002	11 0	0 44.0	20 45	1 23.0	1.3887	1.3060	3.11	0.4926
	30	0.9156	3.693	−0.002	11 0	0 44.0	19 48	1 19.2	1.3895	1.3065	2.98	0.4735
Dec.	1	0.9183	+3.703	−0.006	11 3	0 44.2	18 51	1 15.4	+1.3902	+1.3069	+2.84	+0.4534
	2	0.9210	3.714	0.010	11 8	0 44.5	17 54	1 11.6	1.3912	1.3073	2.71	0.4322
	3	0.9238	3.724	0.010	11 14	0 44.9	16 57	1 7.8	1.3925	1.3077	2.57	0.4097
	4	0.9265	3.735	0.009	11 21	0 45.4	16 0	1 4.0	1.3941	1.3080	2.43	0.3859
h	5	0.9293	3.745	−0.004	11 25	0 45.7	15 4	1 0.3	1.3960	1.3084	2.29	0.3604
(5.0)	6	0.9320	+3.755	+0.002	11 28	0 45.9	14 7	0 56.5	+1.3979	+1.3087	+2.15	+0.3332
	7	0.9347	3.766	0.006	11 28	0 45.9	13 10	0 52.7	1.3997	1.3090	2.01	0.3041
	8	0.9375	3.776	0.012	11 27	0 45.8	12 14	0 48.9	1.4014	1.3093	1.87	0.2727
	9	0.9402	3.787	0.014	11 22	0 45.5	11 18	0 45.2	1.4028	1.3096	1.73	0.2388
	10	0.9429	3.797	0.015	11 16	0 45.1	10 21	0 41.4	1.4039	1.3098	1.59	0.2019
	11	0.9457	+3.808	+0.012	11 10	0 44.7	9 25	0 37.7	+1.4047	+1.3100	+1.45	+0.1610
	12	0.9484	3.819	0.007	11 8	0 44.5	8 29	0 33.9	1.4053	1.3102	1.31	0.1160
	13	0.9512	3.830	+0.002	11 7	0 44.5	7 32	0 30.1	1.4059	1.3104	1.16	0.0656
	14	0.9539	3.840	−0.003	11 8	0 44.5	6 36	0 26.4	1.4065	1.3106	1.02	0.0085
	15	0.9566	3.851	0.009	11 11	0 44.7	5 40	0 22.7	1.4072	1.3107	0.88	9.9425
	16	0.9594	+3.862	−0.012	11 13	0 44.9	4 44	0 18.9	+1.4081	+1.3108	+0.73	+9.8644
	17	0.9621	3.873	0.015	11 17	0 45.1	3 48	0 15.2	1.4092	1.3109	0.59	9.7691
	18	0.9648	3.884	0.014	11 22	0 45.5	2 52	0 11.5	1.4106	1.3110	0.44	9.6464
	19	0.9676	3.894	0.011	11 26	0 45.7	1 56	0 7.7	1.4122	1.3111	0.30	9.4747
h	20	0.9703	3.905	0.006	11 27	0 45.8	1 0	0 4.0	1.4140	1.3111	0.15	9.1860
(6.0)	21	0.9731	+3.916	−0.001	11 25	0 45.7	0 4	0 0.3	+1.4158	+1.3111	+0.01	+7.9155
	22	0.9758	3.927	+0.005	11 23	0 45.5	359 8	23 56.5	1.4175	1.3111	−0.14	−9.1347
	23	0.9785	3.938	0.008	11 18	0 45.2	358 11	23 52.7	1.4190	1.3111	0.28	9.4491
	24	0.9813	3.948	0.010	11 11	0 44.7	357 15	23 49.0	1.4201	1.3110	0.43	9.6295
	25	0.9840	3.959	0.008	11 4	0 44.3	356 19	23 45.3	1.4210	1.3109	0.57	9.7565
	26	0.9868	+3.970	+0.003	10 59	0 43.9	355 23	23 41.5	+1.4214	+1.3108	−0.72	−9.8545
	27	0.9895	3.981	−0.003	10 57	0 43.8	354 27	23 37.8	1.4220	1.3107	0.86	9.9343
	28	0.9922	3.991	0.008	10 56	0 43.7	353 30	23 34.0	1.4226	1.3106	1.00	0.0018
	29	0.9950	4.002	0.011	10 58	0 43.9	352 34	23 30.3	1.4234	1.3104	1.15	0.0597
	30	0.9977	4.012	0.012	11 1	0 44.1	351 38	23 26.5	1.4245	1.3102	1.29	0.1108
	31	1.0004	+4.023	−0.011	11 4	0 44.3	350 42	23 22.8	+1.4259	+1.3100	−1.43	−0.1549
	32	1.0032	+4.034	−0.006	11 8	0 44.5	349 45	23 19.0	+1.4277	+1.3098	−1.57	−0.1960

MEAN PLACES FOR 1900.0. (January $0^d.099$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
33 Piscium	4.7	0 0 13.039	+ 3.0716	− 6 16 1.09	+ 20.138
α Andromedæ	2.1	0 3 13.030	3.0932	+ 28 32 18.01	19.882
β Cassiopeiæ	2.4	0 3 50.347	3.1771	+ 58 35 53.62	19.864
22 Andromedæ	4.9	0 5 7.291	3.1049	+ 45 30 56.82	20.037
γ Pegasi (*Algenib*)	2.8	0 8 5.135	3.0849	+ 14 37 39.47	20.024
σ Andromedæ	4.4	0 13 6.110	+ 3.1239	+ 36 13 50.94	+ 19.967
ι Ceti	3.6	0 14 19.990	3.0574	− 9 22 41.76	19.978
44 Piscium	5.8	0 20 16.577	3.0738	+ 1 23 9.17	19.945
β Hydri	2.8	0 20 30.065	3.2221	− 77 49 2.86	20.285
12 Ceti	6.0	0 24 56.140	3.0620	− 4 30 35.49	19.928
π Andromedæ	4.4	0 31 32.285	+ 3.1941	+ 33 10 7.98	+ 19.858
α Cassiopeiæ (*var.*)	2.3	0 34 49.757	3.3785	+ 55 59 20.20	19.784
β Ceti	2.2	0 38 34.226	3.0133	− 18 32 7.42	19.805
21 Cassiopeiæ	5.7	0 39 2.292	3.8810	+ 74 26 29.38	19.730
ο Cassiopeiæ	4.7	0 39 9.030	3.3252	+ 47 44 13.69	19.749
δ Piscium	4.8	0 43 29.609	+ 3.1090	+ 7 2 27.19	+ 19.643
γ Cassiopeiæ	2.3	0 50 40.146	3.5871	+ 60 10 31.00	19.554
μ Andromedæ	4.0	0 51 12.039	3.3166	+ 37 57 25.13	19.579
43 Cephei (H.)	4.6	0 55 1.472	7.3878	+ 85 43 14.74	19.477
ε Piscium	4.3	0 57 45.149	3.1099	+ 7 21 6.45	19.439
β Andromedæ	2.2	1 4 7.831	+ 3.3464	+ 35 5 25.52	+ 19.151
κ Tucanæ	4.9	1 12 22.628	2.0432	− 69 24 26.57	19.146
f Piscium	5.1	1 12 38.422	3.0914	+ 3 5 16.46	19.022
θ^1 Ceti	3.6	1 19 1.484	2.9975	− 8 41 57.54	18.652
α Ursæ Minoris (*Polaris*)	2.2	1 22 33.190	25.2209	+ 88 46 26.61	18.764
38 Cassiopeiæ	5.9	1 23 46.915	+ 4.3933	+ 69 45 0.23	+ 18.650
η Piscium	3.7	1 26 7.852	3.2037	+ 14 49 49.36	18.645
υ Andromedæ	4.2	1 30 55.520	3.5046	+ 40 54 19.23	18.112
π Piscium	5.5	1 31 47.765	3.1747	+ 11 37 48.22	18.495
α Eridani (*Achernar*)	0.4	1 33 59.419	2.2384	− 57 44 41.31	18.344
ν Piscium	4.6	1 36 13.593	+ 3.1184	+ 4 58 54.00	+ 18.309
ο Piscium	4.4	1 40 6.724	3.1633	+ 8 39 16.19	18.209
ζ Ceti	3.6	1 46 31.465	2.9597	− 10 49 44.33	17.893
β Arietis	2.8	1 49 6.836	3.3056	+ 20 19 9.36	17.707
50 Cassiopeiæ	4.1	1 54 53.199	5.0324	+ 71 56 14.82	17.600
γ Andromedæ	2.2	1 57 45.497	+ 3.6654	+ 41 50 59.92	+ 17.408
α Arietis	2.1	2 1 32.058	3.3730	+ 22 59 22.82	17.150
β Trianguli	3.1	2 3 35.456	3.5570	+ 34 30 51.70	17.158
ξ^1 Ceti	4.5	2 7 41.915	3.1752	+ 8 22 39.48	16.998
γ Trianguli	4.3	2 11 22.030	3.5540	+ 33 23 5.20	16.791
67 Ceti	5.6	2 11 59.699	+ 2.9899	− 6 52 58.62	+ 16.703
δ Hydri	4.2	2 19 58.056	1.0540	− 69 6 51.89	16.441
ι Cassiopeiæ	4.6	2 20 49.307	4.8830	+ 66 57 10.47	16.390
ξ^2 Ceti	4.5	2 22 50.461	+ 3.1847	+ 8 0 42.99	16.271
μ Hydri	5.3	2 33 47.058	− 1.3834	− 79 32 44.84	15.656
δ Ceti	4.1	2 34 21.373	+ 3.0719	− 0 6 9.79	+ 15.674
θ Persei	4.2	2 37 22.002	4.0756	+ 48 48 20.23	15.417
γ Ceti	3.6	2 38 7.086	3.1045	+ 2 48 52.09	15.311
σ Arietis	5.5	2 45 58.210	+ 3.3059	+ 14 40 12.11	+ 14.983

MEAN PLACES FOR 1900.0. (January $0^{d}.099$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
47 Cephei (H.)	5.7	2 52 46.700	+ 7.7784	+79 1 25.07	+ 14.626
ε Arietis	4.6	2 53 29.524	3.4226	+20 56 25.62	14.562
α Ceti	2.6	2 57 3.069	3.1318	+ 3 41 51.04	14.278
β Persei (*Algol*) (*var.*)	2.3	3 1 39.575	3.8881	+40 34 13.82	14.070
48 Cephei (H.)	5.5	3 7 37.247	7.4471	+77 22 2.64	13.642
ζ Arietis	4.8	3 9 9.108	+ 3.4410	+20 40 26.03	+ 13.516
α Persei	1.9	3 17 10.815	+ 4.2618	+49 30 19.36	13.046
ι Hydri	5.7	3 18 26.670	− 1.5816	−77 45 13.41	13.033
f Tauri	4.3	3 25 21.065	+ 3.3071	+12 35 38.51	12.526
ε Eridani	3.7	3 28 13.119	2.8244	− 9 47 47.74	12.352
δ Persei	3.1	3 35 48.131	+ 4.2538	+47 28 4.47	+ 11.761
γ Camelopardalis (H.)	4.6	3 39 47.811	6.2603	+71 1 26.89	11.458
η Tauri	3.1	3 41 32.315	3.5590	+23 47 45.59	11.338
ζ Persei	3.0	3 47 50.646	+ 3.7623	+31 35 12.34	10.916
γ Hydri	3.3	3 48 47.072	− 0.9805	−74 32 44.67	10.975
ε Persei	3.0	3 51 8.492	+ 4.0150	+39 43 15.72	+ 10.659
γ Eridani	3.0	3 53 21.821	2.7978	−13 47 34.41	10.412
A¹ Tauri	4.6	3 58 46.920	3.5410	+21 48 31.63	10.058
c Persei	4.3	4 1 23.983	4.3416	+47 26 44.14	9.885
υ¹ Eridani	4.2	4 6 59.032	2.9265	− 7 5 53.49	9.575
γ Tauri	3.8	4 14 6.093	+ 3.4099	+15 23 10.48	+ 8.911
ε Tauri	3.6	4 22 46.587	+ 3.4989	+18 57 31.41	8.218
δ Mensæ	5.6	4 24 43.799	− 4.1895	−80 26 53.45	8.167
m Persei	6.0	4 26 22.629	+ 4.2113	+42 51 1.36	7.967
α Tauri (*Aldebaran*)	1.0	4 30 10.890	3.4384	+16 18 30.03	7.468
τ Tauri	4.5	4 36 14.529	+ 3.5968	+22 45 54.59	+ 7.145
α Camelopardalis	4.4	4 44 6.395	5.9382	+66 10 22.58	6.524
i Tauri	5.2	4 45 31.390	3.5059	+18 40 11.10	6.366
ι Aurigæ	2.8	4 50 28.806	3.9017	+33 0 28.25	5.967
ζ Aurigæ	3.9	4 55 29.199	4.1869	+40 55 47.99	5.547
11 Orionis	4.7	4 58 51.259	+ 3.4255	+15 15 53.76	+ 5.250
β Eridani	2.9	5 2 56.017	2.9486	− 5 12 56.12	4.867
α Aurigæ (*Capella*)	0.1	5 9 18.035	4.4264	+45 53 47.09	3.970
β Orionis (*Rigel*)	0.3	5 9 43.897	2.8817	− 8 19 1.40	4.362
τ Orionis	3.8	5 12 45.043	2.9119	− 6 57 8.53	4.100
β Tauri	1.8	5 19 58.192	+ 3.7901	+28 31 23.09	+ 3.307
χ Aurigæ	5.0	5 26 13.112	3.9028	+32 7 5.32	2.932
Groombridge 966	6.4	5 26 20.999	7.9993	+74 58 39.95	2.950
δ Orionis (*var.*)	2.3	5 26 53.849	3.0637	− 0 22 23.06	2.883
α Leporis	2.7	5 28 19.183	2.6452	−17 53 37.65	2.762
Groombridge 944	6.4	5 29 54.340	+18.7099	+85 8 49.60	+ 2.622
ε Orionis	1.8	5 31 8.339	3.0430	− 1 15 56.39	2.519
α Columbæ	2.7	5 36 1.680	2.1722	−34 7 38.47	2.055
κ Orionis	2.3	5 43 0.826	2.8445	− 9 42 18.25	1.481
ν Aurigæ	4.1	5 44 33.529	4.1566	+39 7 9.39	1.363
δ Doradus	4.4	5 44 35.590	+ 0.1010	−65 46 22.77	+ 1.353
α Orionis (*var.*)	0.9	5 49 45.472	3.2475	+ 7 23 18.62	0.905
β Aurigæ	2.0	5 52 11.637	+ 4.4013	+44 56 14.64	+ 0.676

MEAN PLACES FOR 1900.0. (January $0^{d}.099$, Washington.)

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
θ Aurigæ	2.9	5	52	54.129	+ 4.0912	+ 37	12	20.41	+ 0.530
ν Orionis	4.5	6	1	51.763	3.4262	+ 14	46	49.70	− 0.189
22 Camelopardalis (H.)	4.7	6	7	49.704	6.6205	+ 69	21	18.43	0.798
η Geminorum	3.5	6	8	50.513	3.6226	+ 22	32	9.10	0.790
μ Geminorum	3.2	6	16	54.663	3.6308	+ 22	33	54.13	1.592
ψ^{1} Aurigæ	5.1	6	17	11.892	+ 4.6268	+ 49	20	20.60	− 1.506
α Argûs (*Canopus*)	−0.8	6	21	43.924	1.3318	− 52	38	27.65	1.889
ν Geminorum	4.2	6	23	1.534	3.5631	+ 20	16	31.95	2.026
γ Geminorum	2.0	6	31	56.122	3.4673	+ 16	29	4.94	2.832
ε Geminorum	3.2	6	37	46.808	3.6935	+ 25	13	48.95	3.308
ψ^{5} Aurigæ	5.4	6	39	32.001	+ 4.3312	+ 43	40	37.37	− 3.281
* α Canis Majoris (*Sirius*)	−1.4	6	40	44.494	2.6436	− 16	34	44.06	4.753
θ Geminorum	3.7	6	46	11.948	+ 3.9593	+ 34	4	54.92	4.064
ζ Mensæ	5.6	6	48	22.360	− 4.9201	− 80	42	29.69	4.134
51 Cephei (H.)	5.3	6	53	43.990	+29.6481	+ 87	12	20.53	4.693
ε Canis Majoris	1.5	6	54	41.742	+ 2.3572	− 28	50	9.10	− 4.736
ζ Geminorum (*var.*)	4.0	6	58	10.711	3.5614	+ 20	43	1.48	5.041
δ Canis Majoris	1.9	7	4	19.484	2.4380	− 26	14	3.54	5.550
63 Aurigæ	5.2	7	4	46.717	+ 4.1350	+ 39	29	1.62	5.594
γ^{2} Volantis (*var.*)	3.9	7	9	35.744	− 0.4976	− 70	20	11.26	5.922
25 Camelopardalis	5.3	7	10	3.729	+12.9082	+ 82	36	16.06	− 6.081
δ Geminorum	3.5	7	14	9.107	3.5876	+ 22	9	59.66	6.388
Piazzi vii, 67	5.7	7	20	28.742	6.2878	+ 68	40	12.11	6.941
β Canis Minoris	3.1	7	21	43.702	3.2561	+ 8	29	27.33	7.045
α^{2} Geminorum (*Castor*)	1.9	7	28	13.223	3.8352	+ 32	6	29.17	7.610
* α Canis Min. (*Procyon*)	0.5	7	34	4.053	+ 3.1429	+ 5	28	52.60	− 9.037
β Geminorum (*Pollux*)	1.2	7	39	11.867	3.6777	+ 28	16	4.21	8.464
φ Geminorum	5.0	7	47	22.718	3.6786	+ 27	1	29.18	9.079
26 Lyncis	5.8	7	47	26.015	4.3862	+ 47	49	26.26	9.062
Groombridge 1374	5.6	7	48	13.936	7.2720	+ 74	11	6.50	9.156
ω^{1} Cancri	6.0	7	54	52.884	+ 3.6359	+ 25	39	59.95	− 9.637
3 Ursæ Majoris (H.)	5.5	8	2	51.906	6.0299	+ 68	46	6.94	10.235
15 Argûs (ρ)	3.1	8	3	17.109	2.5545	− 24	0	57.01	10.219
ζ^{1} Cancri	4.8	8	6	28.673	3.4462	+ 17	56	58.22	10.637
β Cancri	3.8	8	11	5.561	3.2568	+ 9	29	37.87	10.904
30 Monocerotis	3.9	8	20	39.871	+ 3.0001	− 3	34	48.28	− 11.565
θ Chamæleontis	4.6	8	23	38.626	− 1.7218	− 77	9	42.98	11.744
η Cancri	5.4	8	26	55.630	+ 3.4764	+ 20	46	51.45	12.045
σ Hydræ	4.5	8	33	31.889	3.1392	+ 3	41	33.52	12.460
γ Cancri	4.9	8	37	30.032	3.4790	+ 21	49	41.67	12.760
ε Hydræ	3.5	8	41	28.877	+ 3.1808	+ 6	47	9.02	− 13.034
σ^{2} Cancri (*mean*)	5.5	8	48	8.708	3.6711	+ 30	57	29.64	13.444
ι Ursæ Majoris	3.3	8	52	21.823	4.1294	+ 48	26	3.91	13.944
σ^{2} Ursæ Majoris	5.0	9	1	36.017	5.3420	+ 67	32	26.09	14.340
κ Cancri	5.1	9	2	19.918	3.2541	+ 11	4	14.59	14.332
θ Hydræ	4.0	9	9	9.752	+ 3.1245	+ 2	44	10.72	− 15.042
β Argûs	2.0	9	12	6.176	0.6754	− 69	18	18.94	14.810
ι Argûs	2.6	9	14	24.720	+ 1.6045	− 58	51	19.82	− 15.032

* Periodic corrections given in the Appendix are still to be applied to the positions of Sirius and Procyon.

MEAN PLACES FOR 1900.0. (January 0d.099, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
α Lyncis	3.3	9 14 57.896	+ 3.6675	+ 34 48 55.88	− 15.058
α Hydræ	2.1	9 22 40.422	2.9489	− 8 13 30.01	15.473
1 Draconis (H.)	4.5	9 22 51.256	8.9165	+ 81 46 6.91	15.543
d Ursæ Majoris	4.8	9 25 38.869	5.3853	+ 70 16 11.91	15.599
θ Ursæ Majoris	3.2	9 26 10.338	4.0386	+ 52 7 59.73	16.243
10 Leonis Minoris	4.7	9 28 5.973	+ 3.6896	+ 36 50 30.02	− 15.823
ο Leonis	3.8	9 35 48.875	+ 3.2063	+ 10 20 56.75	16.242
ζ Chamæleontis	5.2	9 36 50.110	− 1.6062	− 80 29 30.59	16.234
ε Leonis	3.2	9 40 10.587	+ 3.4136	+ 24 14 5.10	16.453
μ Leonis	4.0	9 47 4.643	3.4200	+ 26 28 40.89	16.823
19 Leonis Minoris	5.2	9 51 33.715	+ 3.6904	+ 41 31 55.09	− 17.003
π Leonis	5.0	9 54 55.785	3.1735	+ 8 31 26.80	17.161
α Leonis (*Regulus*)	1.3	10 3 2.841	3.1996	+ 12 27 21.72	17.495
32 Ursæ Majoris	5.7	10 10 46.626	4.4104	+ 65 36 26.29	17.826
λ Ursæ Majoris	3.6	10 11 4.128	3.6368	+ 43 24 49.97	17.863
γ^1 Leonis	2.5	10 14 27.625	+ 3.3138	+ 20 20 50.88	− 18.110
μ Hydræ	4.1	10 21 15.232	2.8999	− 16 19 32.41	18.293
β Leonis Minoris	4.3	10 22 6.200	3.4835	+ 37 13 10.82	18.357
α Antliæ	4.5	10 22 34.520	2.7420	− 30 33 31.73	18.289
9 Draconis (H.)	5.0	10 26 36.312	5.2249	+ 76 13 41.51	18.415
ρ Leonis	4.0	10 27 32.803	+ 3.1628	+ 9 49 16.68	− 18.441
41 Leonis Minoris	5.1	10 37 58.817	3.2695	+ 23 42 43.19	18.767
η Argûs (*var.*)	1–6	10 41 10.806	2.3175	− 59 9 31.45	18.883
l Leonis	5.3	10 44 0.118	3.1576	+ 11 4 27.67	18.987
δ^2 Chamæleontis	4.7	10 44 50.730	0.6076	− 80 0 46.05	18.987
46 Leonis Minoris	3.9	10 47 43.265	+ 3.3674	+ 34 45 14.72	− 19.340
Groombridge 1706	6.3	10 51 57.796	4.9340	+ 78 18 21.31	19.206
α Ursæ Majoris	2.0	10 57 33.658	+ 3.7406	+ 62 17 27.33	19.378
η Octantis	6.1	11 0 0.930	− 0.3062	− 84 3 21.36	19.370
p^3 Leonis	6.2	11 1 48.201	+ 3.0617	+ 2 29 54.61	19.486
ψ Ursæ Majoris	3.2	11 4 2.651	+ 3.3906	+ 45 2 28.21	− 19.485
δ Leonis	2.7	11 8 47.490	3.1972	+ 21 4 17.86	19.689
ν Ursæ Majoris	3.7	11 13 4.758	3.2514	+ 33 38 24.10	19.602
δ Crateris	3.9	11 14 20.427	2.9964	− 14 14 14.34	19.455
τ Leonis	5.1	11 22 47.696	3.0860	+ 3 24 25.36	19.800
λ Draconis	4.0	11 25 28.366	+ 3.6124	+ 69 52 58.94	− 19.841
ξ Hydræ	3.8	11 28 4.922	2.9433	− 31 18 15.81	19.914
υ Leonis	4.4	11 31 49.725	3.0715	− 0 16 17.71	19.857
χ Ursæ Majoris	3.9	11 40 46.349	3.1854	+ 48 20 2.04	19.956
β Leonis	2.2	11 43 57.584	3.0635	+ 15 7 51.93	20.116
γ Ursæ Majoris	2.4	11 48 34.416	+ 3.1764	+ 54 15 2.79	− 20.017
π Virginis	4.6	11 55 44.917	3.0746	+ 7 10 19.00	20.075
ο Virginis	4.3	12 0 6.935	3.0575	+ 9 17 18.18	20.015
ε Corvi	3.2	12 4 58.843	3.0791	− 22 3 48.95	20.039
4 Draconis (H.)	5.1	12 7 31.108	2.8656	+ 78 10 18.96	20.017
γ Corvi	2.7	12 10 39.727	+ 3.0798	− 16 59 11.71	− 20.007
2 Canum Venaticorum	6.0	12 11 7.060	3.0195	+ 41 13 0.39	20.070
β Chamæleontis	4.5	12 12 28.392	+ 3.4193	− 78 45 25.04	− 20.010

MEAN PLACES FOR 1900.0. (January 0^d.099, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
6 Ursæ Minoris (B.)	6.2	12 14 23.100	+ 0.2459	+ 88 15 15.20	− 19.949
η Virginis	4.0	12 14 47.392	3.0689	− 0 6 39.81	20.032
α^1 Crucis	0.9	12 21 1.952	3.3016	− 62 32 41.47	20.002
δ^2 Corvi	3.1	12 24 41.358	3.0994	− 15 57 31.22	20.079
β Canum Venaticorum	4.4	12 28 59.759	2.8593	+ 41 54 3.06	19.606
β Corvi	2.8	12 29 7.951	+ 3.1430	− 22 50 37.41	− 19.946
κ Draconis	3.8	12 29 13.046	2.5856	+ 70 20 22.03	19.874
γ Virginis (*mean*)	2.9	12 36 35.617	3.0391	− 0 54 3.36	19.789
31 Comæ Berenices	5.1	12 46 49.689	2.9254	+ 28 5 5.50	19.654
32^2 Camelopardalis (H.)	5.2	12 48 23.178	0.4082	+ 83 57 23.39	19.585
α Canum Venaticorum	3.2	12 51 21.060	+ 2.8128	+ 38 51 30.29	− 19.497
δ Muscæ	3.8	12 55 23.260	4.0524	− 71 0 34.28	19.502
ε Virginis	3.1	12 57 11.943	2.9865	+ 11 29 47.76	19.412
θ Virginis	4.6	13 4 46.289	3.1020	− 5 0 18.50	19.292
20 Canum Venaticorum	4.7	13 13 3.608	2.6976	+ 41 5 56.79	19.022
α Virginis (*Spica*)	1.1	13 19 55.433	+ 3.1553	− 10 38 21.60	− 18.872
κ Octantis	5.4	13 24 42.080	8.8373	− 85 16 24.70	18.716
ζ Virginis	3.6	13 29 35.815	3.0536	− 0 5 4.61	18.495
B. A. C. 4536	5.0	13 30 19.975	2.6832	+ 37 41 41.05	18.514
m Virginis	5.4	13 36 21.743	3.1436	− 8 11 54.25	18.267
η Ursæ Majoris	1.9	13 43 36.075	+ 2.3694	+ 49 48 44.29	− 18.056
η Bootis	2.8	13 49 55.403	2.8568	+ 18 53 56.20	18.148
θ Apodis (*var.*)	5.0	13 55 34.452	5.6950	− 76 18 50.55	17.580
β Centauri	0.7	13 56 45.828	4.1930	− 59 53 25.89	17.534
π Hydræ	3.6	14 0 40.510	3.4060	− 26 12 2.46	17.479
α Draconis	3.7	14 1 40.944	+ 1.6236	+ 64 51 13.52	− 17.276
d Bootis	4.8	14 5 50.407	2.7402	+ 25 33 55.01	17.178
κ Virginis	4.2	14 7 33.623	+ 3.1950	− 9 48 29.82	16.888
4 Ursæ Minoris	4.9	14 9 14.003	− 0.3040	+ 78 1 2.50	16.918
δ Octantis	5.0	14 10 51.970	+ 9.0956	− 83 12 35.46	16.882
α Bootis (*Arcturus*)	0.2	14 11 6.000	+ 2.7351	+ 19 42 10.66	− 18.858
λ Bootis	4.3	14 12 34.987	2.2838	+ 46 32 50.77	16.634
λ Virginis	4.7	14 13 41.834	3.2387	− 12 54 38.99	16.710
θ Bootis	4.1	14 21 47.592	2.0435	+ 52 18 46.45	16.736
ρ Bootis	3.6	14 27 31.236	+ 2.5867	+ 30 48 37.06	15.922
5 Ursæ Minoris	4.5	14 27 43.874	− 0.1802	+ 76 8 26.17	− 16.004
α^2 Centauri	0.2	14 32 48.204	+ 4.0437	− 60 25 21.77	15.025
33 Bootis	5.3	14 35 6.987	2.2345	+ 44 50 9.63	15.672
α Apodis	4.1	14 35 25.483	7.2310	− 78 37 12.60	15.632
ε Bootis	2.6	14 40 37.190	2.6202	+ 27 29 44.52	15.313
α^2 Libræ	2.9	14 45 20.691	+ 3.3114	− 15 37 34.49	− 15.128
β Ursæ Minoris	2.2	14 50 59.649	− 0.2196	+ 74 33 51.05	14.719
β Bootis	3.7	14 58 10.762	+ 2.2600	+ 40 47 5.67	14.327
γ Scorpii	3.4	14 58 12.955	3.5018	− 24 53 20.04	14.332
δ Bootis	3.5	15 11 28.279	2.4191	+ 33 41 15.93	13.575
β Libræ	2.9	15 11 37.484	+ 3.2230	− 9 0 50.38	− 13.462
ρ Octantis	5.7	15 20 11.490	13.1265	− 84 7 55.02	12.794
μ^1 Bootis	4.5	15 20 42.769	+ 2.2661	+ 37 43 40.00	− 12.757

MEAN PLACES FOR 1900.0. (January 0$^{\mathrm{d}}$.099, Washington.)

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
γ^{2} Ursæ Minoris . .	3.2	15	20	53.105	− 0.1269	+ 72	11	23.33	− 12.813
β Coronæ Borealis .	3.9	15	23	42.370	+ 2.4735	+ 29	27	1.16	12.558
α Coronæ Borealis .	2.3	15	30	27.224	2.5391	+ 27	3	4.00	12.272
α Serpentis . . .	2.7	15	39	20.507	2.9521	+ 6	44	24.53	11.503
ε Serpentis . . .	3.7	15	45	49.830	+ 2.9874	+ 4	46	43.45	11.007
ζ Ursæ Minoris . .	4.6	15	47	37.377	− 2.2336	+ 78	6	7.90	− 10.950
ε Coronæ Borealis . .	4.1	15	53	26.813	+ 2.4818	+ 27	10	2.36	10.583
δ Scorpii . . .	2.6	15	54	25.130	3.5399	− 22	20	13.71	10.478
β^{1} Scorpii . . .	2.9	15	59	37.236	3.4814	− 19	31	54.28	10.080
δ^{1} Apodis . . .	4.9	16	5	23.578	8.8027	− 78	26	37.69	9.667
φ Herculis . . .	4.2	16	5	37.142	+ 1.8890	+ 45	11	49.26	− 9.558
Groombridge 2320 .	5.5	16	6	2.918	0.1469	+ 68	4	24.62	9.510
δ Ophiuchi . . .	2.8	16	9	6.260	3.1402	− 3	26	12.81	9.470
σ Coronæ Borealis . .	5.3	16	10	56.013	2.2453	+ 34	6	43.32	9.255
τ Herculis . . .	3.9	16	16	44.108	1.8024	+ 46	33	5.02	8.701
γ Apodis . . .	4.0	16	18	6.301	+ 9.0565	− 78	40	21.19	− 8.707
η Ursæ Minoris . .	5.0	16	20	25.304	− 1.8075	+ 75	59	9.05	8.185
η Draconis . . .	2.8	16	22	38.175	+ 0.8050	+ 61	44	25.78	8.205
α Scorpii (*Antares*) .	1.2	16	23	16.479	3.6719	− 26	12	36.39	8.240
β Herculis . . .	2.8	16	25	55.219	+ 2.5769	+ 21	42	26.42	8.025
A Draconis . . .	5.0	16	28	10.574	− 0.1358	+ 68	59	4.17	− 7.783
ζ Ophiuchi . . .	2.8	16	31	39.090	+ 3.2995	− 10	21	52.55	7.516
α Trianguli Australis .	2.2	16	38	4.345	6.3098	− 68	50	38.71	7.061
η Herculis . . .	3.7	16	39	28.040	2.0552	+ 39	6	44.24	6.993
κ Ophiuchi . . .	3.4	16	52	56.070	+ 2.8376	+ 9	31	49.32	5.794
ε Ursæ Minoris . .	4.5	16	56	12.222	− 6.3055	+ 82	12	7.68	− 5.509
d Herculis . . .	5.3	16	57	54.815	+ 2.2116	+ 33	42	46.38	5.373
η Ophiuchi . . .	2.5	17	4	38.521	3.4364	− 15	36	3.99	4.704
α^{1} Herculis (*var.*) . .	3.2	17	10	5.248	2.7340	+ 14	30	15.03	4.302
π Herculis . . .	3.4	17	11	33.816	2.0879	+ 36	55	18.21	4.206
θ Ophiuchi . . .	3.3	17	15	52.039	+ 3.6806	− 24	53	59.07	− 3.872
b Ophiuchi (*var.*) . .	4.4	17	20	15.721	3.6598	− 24	5	0.31	3.596
δ Aræ	3.8	17	22	4.168	5.4020	− 60	36	1.99	3.422
β Draconis . . .	3.0	17	28	10.376	1.3535	+ 52	22	31.20	2.766
α Ophiuchi . . .	2.2	17	30	17.537	2.7833	+ 12	37	57.60	2.826
ι Herculis . . .	4.0	17	36	38.540	+ 1.6930	+ 46	3	34.07	− 2.037
ω Draconis . . .	4.9	17	37	32.173	− 0.3558	+ 68	48	15.03	1.644
μ Herculis . . .	3.5	17	42	32.677	+ 2.3465	+ 27	46	44.59	2.274
ψ^{1} Draconis . . .	4.8	17	43	42.942	− 1.0772	+ 72	11	52.66	1.691
θ Herculis . . .	3.9	17	52	49.412	+ 2.0568	+ 37	15	49.10	0.623
γ Draconis . . .	2.5	17	54	17.048	+ 1.3920	+ 51	30	1.97	− 0.524
γ^{2} Sagittarii . . .	2.9	17	59	23.001	3.8517	− 30	25	32.62	− 0.250
ο Herculis . . .	3.9	18	3	38.491	+ 2.3391	+ 28	44	55.01	+ 0.320
δ Ursæ Minoris . .	4.4	18	4	32.720	− 19.4878	+ 86	36	47.71	0.446
μ^{1} Sagittarii . . .	4.1	18	7	46.965	+ 3.5869	− 21	5	6.14	0.679
η Serpentis . . .	3.5	18	16	8.102	+ 3.1025	− 2	55	28.73	+ 0.730
λ Sagittarii . . .	2.9	18	21	47.964	+ 3.7029	− 25	28	37.38	1.706
χ Draconis . . .	3.8	18	22	51.678	− 1.0773	+ 72	41	22.04	+ 1.622

MEAN PLACES FOR 1900.0. (January $0^d.099$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
ι Aquilæ	4.0	18 29 45.921	+ 3.2646	− 8 18 50.51	+ 2.281
ζ Pavonis	4.2	18 31 21.034	7.0266	−71 30 49.24	2.574
α Lyræ (*Vega*)	0.2	18 33 33.162	2.0312	+38 41 25.71	3.204
β Lyræ (*var.*)	3.6	18 46 23.270	2.2145	+33 14 47.23	4.025
σ Sagittarii	2.3	18 49 3.867	+ 3.7209	−26 25 15.55	4.184
50 Draconis	5.6	18 49 36.162	− 1.9120	+75 18 57.46	+ 4.357
γ Lyræ	3.3	18 55 12.160	+ 2.2433	+32 33 8.08	4.777
σ Octantis	5.6	18 59 43.260	102.4277	−89 15 16.41	5.161
ζ Aquilæ	3.1	19 0 48.831	2.7568	+13 42 52.88	5.158
ι Lyræ	5.2	19 3 44.020	2.1411	+35 56 35.38	5.484
d Sagittarii	5.0	19 11 47.065	+ 3.5119	−19 7 51.30	+ 6.160
δ Draconis	3.1	19 12 32.009	0.0258	+67 29 8.29	6.327
θ Lyræ	4.4	19 12 53.810	+ 2.0805	+37 57 20.09	6.276
τ Draconis	4.5	19 17 28.776	− 1.1268	+73 10 11.70	6.759
δ Aquilæ	3.5	19 20 27.393	+ 3.0252	+ 2 54 55.04	6.975
λ Ursæ Minoris	6.5	19 22 29.610	−67.8223	+88 59 15.81	+ 7.070
β Cygni	3.1	19 26 41.304	+ 2.4187	+27 44 58.25	7.394
κ Aquilæ	5.0	19 31 30.743	3.2295	− 7 14 59.28	7.795
β Sagittæ	4.5	19 36 33.448	2.6939	+17 14 39.33	8.167
γ Aquilæ	2.8	19 41 30.333	2.8521	+10 22 9.95	8.588
δ Cygni	2.9	19 41 51.005	+ 1.8760	+44 53 11.62	+ 8.663
α Aquilæ (*Altair*)	0.9	19 45 54.261	+ 2.9274	+ 8 36 14.68	9.315
ε Draconis	3.9	19 48 30.891	− 0.1810	+70 0 47.58	9.168
ε Pavonis	4.1	19 49 1.750	+ 7.0121	−73 10 27.01	9.061
β Aquilæ	3.9	19 50 24.078	2.9470	+ 6 9 24.82	8.807
γ Sagittæ	3.6	19 54 18.588	+ 2.6673	+19 13 13.53	+ 9.615
c Sagittarii	4.5	19 56 30.609	3.6950	−27 59 16.43	9.771
τ Aquilæ	5.7	19 59 15.310	2.9311	+ 6 59 44.90	9.996
θ Aquilæ	3.3	20 6 8.735	3.0966	− 1 7 5.36	10.491
31 Cygni	3.9	20 10 28.999	+ 1.8900	+46 26 16.58	10.812
κ Cephei (*pr.*)	4.4	20 12 15.754	− 1.9402	+77 24 37.16	+ 10.963
α^2 Capricorni	3.7	20 12 30.419	+ 3.3317	−12 51 17.01	10.977
α Pavonis	2.1	20 17 44.281	4.7731	−57 3 19.83	11.243
γ Cygni	2.3	20 18 38.355	2.1524	+39 56 11.28	11.401
π Capricorni	5.1	20 21 35.884	3.4380	−18 32 22.24	11.610
ε Delphini	4.0	20 28 26.147	+ 2.8666	+10 57 47.74	+ 12.070
Groombridge 3241	6.5	20 30 26.505	− 0.2284	+72 11 34.37	12.216
α Delphini	3.9	20 34 59.612	+ 2.7868	+15 33 33.57	12.564
β Pavonis	3.4	20 35 57.018	5.4607	−66 33 45.14	12.610
α Cygni	1.4	20 38 1.361	2.0444	+44 55 22.31	12.750
ψ Capricorni	4.3	20 40 10.570	+ 3.5591	−25 37 48.50	+ 12.750
ε Cygni	2.6	20 42 9.905	2.4270	+33 35 44.04	13.356
μ Aquarii	4.8	20 47 15.655	+ 3.2390	− 9 21 31.24	13.327
12 Year Catalogue, 1879	5.3	20 52 8.052	− 2.5806	+80 10 38.61	13.655
ν Cygni	4.1	20 53 26.689	+ 2.2350	+40 46 55.15	13.746
61^1 Cygni	5.4	21 2 24.821	+ 2.6846	+38 15 27.05	+ 17.568
ζ Cygni	3.3	21 8 40.795	2.5515	+29 48 59.78	14.641
τ Cygni	3.8	21 10 47.943	+ 2.3934	+37 37 6.35	+ 15.261

MEAN PLACES FOR 1900.0. (January 0^d.099, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
α Cephei	2.6	21 16 11.624	+ 1.4361	+ 62 9 42.51	+ 15.190
1 Pegasi	4.3	21 17 27.707	2.7738	+ 19 22 35.62	15.277
ζ Capricorni	3.8	21 20 57.560	3.4328	− 22 50 40.17	15.430
β Aquarii	2.9	21 26 17.716	3.1610	− 6 0 40.32	15.694
β Cephei (*pr.*)	3.4	21 27 22.331	0.7913	+ 70 7 18.06	15.769
ξ Aquarii	4.8	21 32 25.754	+ 3.1969	− 8 18 9.84	+ 16.009
74 Cygni	5.0	21 32 56.441	2.4022	+ 39 57 51.05	16.068
λ^1 Octantis	5.4	21 35 36.580	9.7084	− 83 10 43.53	16.182
ε Pegasi	2.4	21 39 16.468	2.9462	+ 9 24 59.10	16.384
11 Cephei	4.8	21 40 27.479	0.8931	+ 70 51 3.27	16.537
π^2 Cygni	4.5	21 43 5.900	+ 2.2131	+ 48 50 48.43	+ 16.575
μ Capricorni	5.2	21 47 50.687	3.2747	− 14 1 21.49	16.806
16 Pegasi	5.1	21 48 30.705	2.7276	+ 25 27 16.58	16.843
79 Draconis	6.6	21 51 36.974	0.7260	+ 73 13 44.95	16.998
α Aquarii	3.0	22 0 38.896	3.0826	− 0 48 20.51	17.387
α Gruis	1.9	22 1 55.933	+ 3.8005	− 47 26 43.41	+ 17.270
π^2 Pegasi	4.3	22 5 32.742	2.6614	+ 32 41 14.74	17.580
θ Aquarii	4.4	22 11 33.444	3.1683	− 8 16 52.46	17.826
υ Octantis	6.2	22 12 34.970	12.8352	− 86 28 33.80	17.955
γ Aquarii	4.0	22 16 29.496	3.0997	− 1 53 28.38	18.052
π Aquarii	4.6	22 20 10.204	+ 3.0642	+ 0 52 11.48	+ 18.174
σ Aquarii	4.9	22 25 21.371	3.1785	− 11 11 22.86	18.335
α Lacertæ	3.9	22 27 10.262	2.4655	+ 49 46 5.79	18.438
η Aquarii	4.2	22 30 13.086	3.0836	− 0 37 58.61	18.475
226 Cephei (B.)	5.7	22 30 31.089	1.0700	+ 75 42 39.79	18.538
10 Lacertæ	5.0	22 34 46.407	+ 2.6868	+ 38 31 46.93	+ 18.665
β Octantis	4.4	22 35 50.470	6.4104	− 81 54 20.96	18.717
ζ Pegasi	3.5	22 36 28.474	2.9910	+ 10 18 33.28	18.716
λ Pegasi	4.1	22 41 42.814	2.8857	+ 23 2 21.63	18.880
ι Cephei	3.6	22 46 7.157	2.1246	+ 65 40 27.75	18.888
λ Aquarii	3.8	22 47 23.880	+ 3.1319	− 8 6 42.33	+ 19.084
α Pis. Aust. (*Fomalhaut*).	1.3	22 52 7.570	3.3241	− 30 9 8.22	19.001
ο Andromedæ	3.8	22 57 19.110	2.7518	+ 41 47 18.59	19.292
α Pegasi (*Markab*).	2.5	22 59 46.741	2.9855	+ 14 40 1.83	19.320
φ Aquarii	4.3	23 9 8.625	3.1079	− 6 35 17.34	19.360
ο Cephei	5.1	23 14 31.037	+ 2.4455	+ 67 33 51.57	+ 19.671
τ Pegasi	4.6	23 15 41.180	2.9641	+ 23 11 34.50	19.661
θ Piscium	4.3	23 22 53.707	3.0416	+ 5 49 47.01	19.744
λ Andromedæ	3.8	23 32 40.081	2.9239	+ 45 54 58.92	19.484
ι Piscium	4.3	23 34 48.394	3.0839	+ 5 5 3.39	19.490
γ Cephei	3.5	23 35 14.485	+ 2.4274	+ 77 4 27.30	+ 20.087
i^1 Aquarii	5.2	23 39 0.942	3.1160	− 18 49 55.25	19.957
δ Sculptoris	4.6	23 43 43.052	3.1302	− 28 41 0.59	19.864
γ^1 Octantis	5.2	23 46 14.500	3.6599	− 82 34 28.71	19.996
Groombridge 4163	6.6	23 49 57.604	2.8661	+ 73 51 13.82	20.023
ω Piscium	4.2	23 54 10.551	+ 3.0788	+ 6 18 35.06	+ 19.933

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*α* Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	*δ* Ursæ Minoris.		Mean Solar Date.	*λ* Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Jan.	1 22	+88 46	Jan.	6 54	+87 12	Jan.	18 4	+86 36	Jan.	19 20	+88 59
	s	″		s	″		s	″		s	″
0.3	61.14	52.3	0.5	21.44	15.2	0.9	3.18	46.9	1.0	52.95	24.1
1.3	60.18	52.4	1.5	21.62	15.6	1.9	3.16	46.5	2.0	52.39	23.7
2.3	59.16	52.6	2.5	21.77	15.9	2.9	3.14	46.1	3.0	51.88	23.4
3.3	58.10	52.7	3.5	21.88	16.2	3.9	3.16	45.8	4.0	51.46	23.1
4.3	57.02	52.9	4.5	21.98	16.6	4.9	3.21	45.4	5.0	51.15	22.7
5.3	55.95	52.9	5.5	22.05	16.9	5.9	3.27	45.1	6.0	50.90	22.4
6.3	54.91	53.0	6.5	22.09	17.3	6.9	3.33	44.7	7.0	50.72	22.0
7.3	53.91	53.0	7.5	22.10	17.6	7.9	3.42	44.4	8.0	50.57	21.7
8.3	52.96	53.1	8.5	22.12	17.9	8.9	3.50	44.1	9.0	50.45	21.4
9.3	52.07	53.1	9.5	22.13	18.2	9.9	3.57	43.8	10.0	50.30	21.1
10.2	51.21	53.2	10.5	22.17	18.4	10.9	3.63	43.5	11.0	50.13	20.8
11.2	50.34	53.2	11.5	22.21	18.7	11.9	3.69	43.2	12.0	49.92	20.6
12.2	49.47	53.3	12.5	22.25	19.0	12.9	3.73	42.9	13.0	49.69	20.3
13.2	48.57	53.3	13.5	22.30	19.3	13.9	3.80	42.6	13.9	49.43	20.0
14.2	47.60	53.4	14.5	22.37	19.6	14.9	3.86	42.3	14.9	49.22	19.6
15.2	46.57	53.5	15.5	22.38	19.9	15.9	3.96	42.0	15.9	49.06	19.3
16.2	45.49	53.5	16.5	22.39	20.3	16.9	4.07	41.6	16.9	48.97	18.9
17.2	44.39	53.5	17.5	22.36	20.6	17.9	4.21	41.2	17.9	48.95	18.6
18.2	43.26	53.5	18.5	22.32	21.0	18.9	4.37	40.9	18.9	49.05	18.2
19.2	42.15	53.5	19.5	22.23	21.3	19.9	4.55	40.6	19.9	49.21	17.9
20.2	41.09	53.5	20.4	22.13	21.7	20.9	4.74	40.3	20.9	49.42	17.5
21.2	40.07	53.4	21.4	22.01	22.0	21.9	4.92	40.0	21.9	49.66	17.2
22.2	39.13	53.3	22.4	21.88	22.2	22.9	5.10	39.7	22.9	49.90	16.9
23.2	38.22	53.3	23.4	21.78	22.5	23.9	5.27	39.5	23.9	50.09	16.6
24.2	37.36	53.2	24.4	21.67	22.8	24.9	5.43	39.2	24.9	50.26	16.4
25.2	36.51	53.2	25.4	21.59	23.0	25.9	5.58	39.0	25.9	50.37	16.1
26.2	35.63	53.2	26.4	21.53	23.3	26.9	5.71	38.7	26.9	50.46	15.8
27.2	34.74	53.1	27.4	21.45	23.6	27.9	5.85	38.4	27.9	50.54	15.5
28.2	33.79	53.1	28.4	21.38	23.9	28.9	6.01	38.1	28.9	50.64	15.2
29.2	32.77	53.1	29.4	21.29	24.2	29.9	6.17	37.8	29.9	50.80	14.8
30.2	31.72	53.1	30.4	21.18	24.6	30.9	6.38	37.5	30.9	51.03	14.5
31.2	30.65	53.0	31.4	21.05	24.9	31.9	6.61	37.2	31.9	51.34	14.1
32.2	29.58	52.9	32.4	20.88	25.2	32.9	6.84	36.9	32.9	51.75	13.8

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Feb.	1 22	+88 46	Feb.	6 54	+87 12	Feb.	18 4	+86 36	Feb.	19 20	+88 59
	s	″		s	″		s	″		s	″
1.2	29.58	52.9	1.4	20.88	25.2	1.9	6.84	36.9	1.9	51.75	13.8
2.2	28.56	52.8	2.4	20.68	25.5	2.9	7.10	36.6	2.9	52.22	13.5
3.2	27.58	52.7	3.4	20.46	25.8	3.9	7.36	36.4	3.9	52.73	13.2
4.2	26.65	52.5	4.4	20.25	26.1	4.9	7.63	36.2	4.9	53.26	12.9
5.2	25.78	52.4	5.4	20.01	26.3	5.9	7.87	35.9	5.9	53.79	12.6
6.2	24.96	52.2	6.4	19.79	26.6	6.9	8.12	35.7	6.9	54.31	12.3
7.2	24.18	52.1	7.4	19.59	26.8	7.9	8.36	35.5	7.9	54.76	12.1
8.2	23.40	52.0	8.4	19.41	27.0	8.9	8.58	35.3	8.9	55.20	11.8
9.2	22.57	51.9	9.4	19.20	27.3	9.9	8.80	35.1	9.9	55.61	11.6
10.2	21.74	51.8	10.4	19.02	27.5	10.9	9.04	34.9	10.9	56.03	11.3
11.2	20.85	51.7	11.4	18.83	27.8	11.9	9.28	34.6	11.9	56.51	11.0
12.2	19.91	51.6	12.4	18.61	28.1	12.9	9.54	34.4	12.9	57.04	10.7
13.2	18.94	51.4	13.4	18.37	28.4	13.9	9.83	34.1	13.9	57.63	10.4
14.2	17.95	51.2	14.4	18.11	28.6	14.9	10.15	33.9	14.9	58.32	10.1
15.1	17.00	51.1	15.4	17.80	28.9	15.9	10.49	33.7	15.9	59.09	9.8
16.1	16.09	50.8	16.4	17.49	29.2	16.8	10.82	33.5	16.9	59.93	9.5
17.1	15.23	50.6	17.4	17.15	29.4	17.8	11.16	33.3	17.9	60.79	9.2
18.1	14.44	50.4	18.4	16.80	29.6	18.8	11.51	33.1	18.9	61.64	9.0
19.1	13.72	50.2	19.4	16.48	29.8	19.8	11.83	33.0	19.9	62.47	8.8
20.1	13.05	50.0	20.4	16.15	30.0	20.8	12.13	32.8	20.9	63.27	8.6
21.1	12.40	49.8	21.4	15.84	30.2	21.8	12.43	32.7	21.9	64.00	8.4
22.1	11.78	49.6	22.4	15.57	30.4	22.8	12.70	32.6	22.9	64.70	8.2
23.1	11.12	49.4	23.4	15.30	30.5	23.8	12.98	32.4	23.9	65.37	7.9
24.1	10.43	49.2	24.3	15.02	30.7	24.8	13.26	32.3	24.9	66.04	7.7
25.1	9.69	49.0	25.3	14.75	30.9	25.8	13.56	32.1	25.9	66.76	7.5
26.1	8.91	48.8	26.3	14.44	31.2	26.8	13.87	31.9	26.9	67.52	7.2
27.1	8.13	48.6	27.3	14.11	31.4	27.8	14.21	31.7	27.9	68.36	7.0
28.1	7.34	48.4	28.3	13.77	31.6	28.8	14.57	31.6	28.9	69.28	6.7
29.1	6.57	48.2	29.3	13.40	31.8	29.8	14.93	31.4	29.9	70.28	6.5

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	1 21	+88 46	Mar.	6 54	+87 12	Mar.	18 4	+86 36	Mar.	19 21	+88 59
	s	″		s	″		s	″		s	″
1.1	66.57	48.2	1.3	13.40	31.8	1.8	14.93	31.4	1.9	10.28	6.5
2.1	65.87	47.9	2.3	12.99	32.0	2.8	15.30	31.3	2.9	11.32	6.2
3.1	65.22	47.6	3.3	12.59	32.2	3.8	15.68	31.2	3.9	12.39	6.0
4.1	64.66	47.3	4.3	12.19	32.3	4.8	16.04	31.2	4.9	13.45	5.9
5.1	64.16	47.0	5.3	11.79	32.5	5.8	16.40	31.1	5.9	14.48	5.7
6.1	63.70	46.8	6.3	11.40	32.6	6.8	16.74	31.1	6.9	15.46	5.6
7.1	63.27	46.5	7.3	11.05	32.7	7.8	17.06	31.0	7.9	16.40	5.4
8.1	62.82	46.3	8.3	10.70	32.8	8.8	17.37	31.0	8.9	17.31	5.3
9.1	62.37	46.0	9.3	10.34	32.9	9.8	17.68	30.9	9.8	18.20	5.1
10.1	61.87	45.8	10.3	10.01	33.0	10.8	18.02	30.8	10.8	19.11	5.0
11.1	61.32	45.6	11.3	9.65	33.2	11.8	18.35	30.7	11.8	20.08	4.8
12.1	60.74	45.3	12.3	9.27	33.3	12.8	18.72	30.6	12.8	21.10	4.6
13.1	60.17	45.0	13.3	8.87	33.5	13.8	19.12	30.5	13.8	22.20	4.4
14.1	59.58	44.7	14.3	8.43	33.6	14.8	19.50	30.5	14.8	23.37	4.2
15.1	59.04	44.4	15.3	7.98	33.8	15.8	19.92	30.4	15.8	24.59	4.1
16.1	58.58	44.1	16.3	7.51	33.9	16.8	20.33	30.4	16.8	25.85	4.0
17.1	58.18	43.8	17.3	7.05	33.9	17.8	20.72	30.4	17.8	27.11	3.8
18.1	57.86	43.4	18.3	6.59	34.0	18.8	21.12	30.4	18.8	28.35	3.7
19.1	57.59	43.1	19.3	6.14	34.0	19.8	21.49	30.5	19.8	29.54	3.7
20.1	57.39	42.8	20.3	5.70	34.1	20.8	21.84	30.5	20.8	30.67	3.6
21.1	57.20	42.5	21.3	5.30	34.1	21.8	22.17	30.6	21.8	31.74	3.6
22.0	56.99	42.2	22.3	4.93	34.1	22.7	22.49	30.6	22.8	32.76	3.5
23.0	56.77	41.9	23.3	4.55	34.2	23.7	22.82	30.6	23.8	33.75	3.4
24.0	56.52	41.7	24.3	4.19	34.2	24.7	23.14	30.6	24.8	34.79	3.3
25.0	56.22	41.4	25.3	3.81	34.3	25.7	23.48	30.6	25.8	35.84	3.2
26.0	55.90	41.1	26.3	3.42	34.4	26.7	23.83	30.6	26.8	36.94	3.1
27.0	55.56	40.8	27.3	2.99	34.4	27.7	24.20	30.6	27.8	38.12	3.0
28.0	55.28	40.5	28.3	2.55	34.5	28.7	24.60	30.6	28.8	39.36	2.9
29.0	55.04	40.2	29.3	2.08	34.5	29.7	24.99	30.7	29.8	40.65	2.8
30.0	54.84	39.8	30.3	1.62	34.5	30.7	25.37	30.8	30.8	41.98	2.8
31.0	54.75	39.5	31.3	1.15	34.5	31.7	25.75	30.9	31.8	43.25	2.8
32.0	54.71	39.2	32.2	0.69	34.5	32.7	26.11	31.0	32.8	44.53	2.8

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Apr.	1 21	+88 46	Apr.	6 53	+87 12	Apr.	18 4	+86 36	Apr.	19 21	+88 59
	s	″		s	″		s	″		s	″
1.0	54.71	39.2	1.2	60.69	34.5	1.7	26.11	31.0	1.8	44.53	2.8
2.0	54.76	38.8	2.2	60.24	34.4	2.7	26.45	31.1	2.8	45.75	2.8
3.0	54.81	38.5	3.2	59.83	34.4	3.7	26.78	31.2	3.8	46.90	2.8
4.0	54.88	38.2	4.2	59.43	34.3	4.7	27.09	31.3	4.8	48.01	2.8
5.0	54.93	37.9	5.2	59.03	34.3	5.7	27.39	31.4	5.8	49.08	2.8
6.0	54.97	37.6	6.2	58.67	34.2	6.7	27.70	31.5	6.8	50.15	2.9
7.0	54.95	37.4	7.2	58.28	34.2	7.7	28.01	31.6	7.8	51.23	2.9
8.0	54.90	37.1	8.2	57.88	34.2	8.7	28.36	31.7	8.8	52.37	2.8
9.0	54.83	36.8	9.2	57.46	34.2	9.7	28.70	31.8	9.8	53.55	2.8
10.0	54.77	36.4	10.2	57.03	34.2	10.7	29.06	31.9	10.8	54.82	2.8
10.9	54.73	36.1	11.2	56.58	34.1	11.7	29.44	32.0	11.8	56.13	2.8
11.9	54.76	35.8	12.2	56.12	34.1	12.7	29.80	32.1	12.8	57.48	2.8
12.9	54.86	35.4	13.2	55.64	34.0	13.7	30.18	32.3	13.8	58.82	2.9
13.9	55.02	35.0	14.2	55.17	33.9	14.7	30.52	32.5	14.8	60.14	2.9
14.9	55.26	34.7	15.2	54.74	33.8	15.7	30.86	32.7	15.8	61.40	3.0
15.9	55.56	34.4	16.2	54.32	33.7	16.7	31.16	32.9	16.8	62.58	3.1
16.9	55.89	34.1	17.2	53.91	33.5	17.7	31.43	33.1	17.7	63.72	3.2
17.9	56.21	33.8	18.2	53.55	33.4	18.7	31.71	33.3	18.7	64.76	3.3
18.9	56.53	33.5	19.2	53.21	33.3	19.7	31.97	33.4	19.7	65.79	3.4
19.9	56.80	33.2	20.2	52.86	33.2	20.7	32.23	33.6	20.7	66.79	3.5
20.9	57.04	33.0	21.2	52.50	33.1	21.7	32.51	33.8	21.7	67.81	3.6
21.9	57.25	32.7	22.2	52.16	33.0	22.7	32.78	33.9	22.7	68.86	3.6
22.9	57.44	32.4	23.2	51.79	32.9	23.7	33.08	34.1	23.7	69.97	3.7
23.9	57.64	32.1	24.2	51.40	32.8	24.7	33.38	34.3	24.7	71.13	3.8
24.9	57.90	31.8	25.2	50.99	32.7	25.7	33.70	34.5	25.7	72.34	3.9
25.9	58.20	31.5	26.2	50.58	32.6	26.7	34.00	34.7	26.7	73.54	4.0
26.9	58.57	31.2	27.2	50.17	32.4	27.7	34.31	34.9	27.7	74.76	4.1
27.9	59.02	30.9	28.2	49.78	32.2	28.7	34.60	35.2	28.7	75.94	4.3
28.9	59.53	30.6	29.2	49.39	32.0	29.6	34.84	35.4	29.7	77.06	4.4
29.9	60.09	30.3	30.2	49.03	31.8	30.6	35.08	35.7	30.7	78.13	4.6
30.9	60.67	30.0	31.2	48.71	31.6	31.6	35.30	36.0	31.7	79.11	4.8
31.9	61.24	29.7									

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
May	1 22	+88 46	May	6 53	+87 12	May	18 4	+86 36	May	19 22	+88 59
	s	″		s	″		s	″		s	″
1.9	1.24	29.7	1.2	48.71	31.6	1.6	35.30	36.0	1.7	19.11	4.8
2.9	1.78	29.5	2.2	48.41	31.4	2.6	35.51	36.2	2.7	20.05	5.0
3.9	2.29	29.3	3.2	48.10	31.2	3.6	35.70	36.4	3.7	20.94	5.2
4.9	2.74	29.0	4.2	47.82	31.0	4.6	35.92	36.7	4.7	21.85	5.3
5.9	3.17	28.8	5.2	47.51	30.8	5.6	36.13	36.9	5.7	22.78	5.4
6.9	3.57	28.5	6.2	47.21	30.7	6.6	36.37	37.1	6.7	23.77	5.6
7.9	4.00	28.2	7.1	46.89	30.5	7.6	36.61	37.3	7.7	24.79	5.7
8.9	4.50	28.0	8.1	46.53	30.4	8.6	36.86	37.6	8.6	25.86	5.9
9.9	5.03	27.7	9.1	46.19	30.2	9.6	37.12	37.8	9.6	26.98	6.0
10.9	5.63	27.4	10.1	45.83	30.0	10.6	37.37	38.1	10.6	28.10	6.2
11.9	6.32	27.1	11.1	45.47	29.7	11.6	37.61	38.4	11.6	29.18	6.4
12.9	7.05	26.8	12.1	45.13	29.5	12.6	37.84	38.7	12.6	30.22	6.6
13.9	7.83	26.6	13.1	44.83	29.2	13.6	38.02	39.0	13.6	31.18	6.9
14.9	8.62	26.4	14.1	44.55	28.9	14.6	38.18	39.3	14.6	32.07	7.2
15.9	9.37	26.2	15.1	44.30	28.7	15.6	38.31	39.6	15.6	32.86	7.4
16.9	10.11	26.0	16.1	44.07	28.4	16.6	28.45	39.9	16.6	33.58	7.6
17.9	10.82	25.8	17.1	43.87	28.2	17.6	38.57	40.2	17.6	34.29	7.9
18.9	11.47	25.6	18.1	43.66	27.9	18.6	38.69	40.5	18.6	34.99	8.1
19.9	12.09	25.4	19.1	43.45	27.7	19.6	38.84	40.8	19.6	35.71	8.3
20.9	12.72	25.2	20.1	43.23	27.5	20.6	38.98	41.0	20.6	36.46	8.5
21.9	13.37	25.0	21.1	43.00	27.3	21.6	39.13	41.3	21.6	37.27	8.7
22.9	14.06	24.8	22.1	42.75	27.1	22.6	39.29	41.6	22.6	38.11	8.9
23.9	14.82	24.6	23.1	42.50	26.8	23.6	39.44	41.9	23.6	38.97	9.1
24.9	15.65	24.4	24.1	42.24	26.6	24.6	39.59	42.2	24.6	39.83	9.4
25.9	16.53	24.2	25.1	42.00	26.3	25.6	39.73	42.5	25.6	40.66	9.7
26.9	17.48	24.0	26.1	41.78	26.0	26.6	39.85	42.9	26.6	41.43	10.0
27.9	18.43	23.8	27.1	41.58	25.7	27.6	39.94	43.2	27.6	42.12	10.3
28.9	19.39	23.6	28.1	41.39	25.3	28.6	40.02	43.6	28.6	42.74	10.6
29.9	20.31	23.5	29.1	41.26	25.0	29.6	40.07	43.9	29.6	43.29	10.8
30.9	21.20	23.4	30.1	41.13	24.7	30.6	40.11	44.2	30.6	43.79	11.1
31.9	22.03	23.2	31.1	41.02	24.4	31.6	40.15	44.5	31.6	44.28	11.4
32.9	22.83	23.1	32.1	40.90	24.2	32.6	40.21	44.8	32.6	44.76	11.7

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
June	1 22	+88 46	June	6 53	+87 12	June	18 4	+86 36	June	19 22	+88 59
	s	″		s	″		s	″		s	″
1.9	22.83	23.1	1.1	40.90	24.2	1.6	40.21	44.8	1.6	44.76	11.7
2.9	23.59	23.0	2.1	40.77	23.9	2.6	40.27	45.1	2.6	45.29	11.9
3.8	24.36	22.8	3.1	40.64	23.7	3.5	40.35	45.4	3.6	45.85	12.2
4.8	25.15	22.7	4.1	40.49	23.4	4.5	40.43	45.7	4.6	46.47	12.4
5.8	25.99	22.5	5.1	40.30	23.1	5.5	40.52	46.0	5.6	47.11	12.7
6.8	26.89	22.4	6.1	40.13	22.9	6.5	40.61	46.3	6.6	47.76	13.0
7.8	27.86	22.2	7.1	39.96	22.6	7.5	40.68	46.7	7.6	48.40	13.3
8.8	28.89	22.0	8.1	39.81	22.2	8.5	40.73	47.0	8.6	48.99	13.6
9.8	29.95	21.9	9.1	39.68	21.9	9.5	40.77	47.4	9.6	49.50	13.9
10.8	31.03	21.8	10.1	39.58	21.5	10.5	40.77	47.8	10.6	49.93	14.3
11.8	32.10	21.7	11.1	39.51	21.2	11.5	40.75	48.1	11.6	50.28	14.6
12.8	33.13	21.7	12.1	39.46	20.8	12.5	40.71	48.5	12.6	50.56	15.0
13.8	34.12	21.6	13.0	39.46	20.5	13.5	40.67	48.8	13.6	50.76	15.3
14.8	35.05	21.6	14.0	39.44	20.2	14.5	40.61	49.1	14.6	50.96	15.6
15.8	35.94	21.5	15.0	39.44	19.9	15.5	40.56	49.4	15.6	51.17	15.9
16.8	36.81	21.5	16.0	39.42	19.7	16.5	40.54	49.7	16.6	51.40	16.2
17.8	37.68	21.4	17.0	39.41	19.4	17.5	40.51	50.0	17.6	51.67	16.5
18.8	38.60	21.3	18.0	39.36	19.1	18.5	40.50	50.3	18.6	51.99	16.8
19.8	39.57	21.2	19.0	39.31	18.8	19.5	40.49	50.6	19.6	52.32	17.1
20.8	40.59	21.2	20.0	39.26	18.5	20.5	40.47	51.0	20.6	52.66	17.4
21.8	41.67	21.1	21.0	39.21	18.2	21.5	40.43	51.3	21.6	52.96	17.7
22.8	42.78	21.0	22.0	39.17	17.8	22.5	40.38	51.7	22.6	53.22	18.0
23.8	43.95	21.0	23.0	39.17	17.5	23.5	40.30	52.0	23.6	53.43	18.4
24.8	45.11	21.0	24.0	39.19	17.1	24.5	40.20	52.4	24.6	53.53	18.8
25.8	46.23	20.9	25.0	39.24	16.8	25.5	40.09	52.7	25.6	53.56	19.1
26.8	47.32	21.0	26.0	39.30	16.4	26.5	39.96	53.1	26.6	53.53	19.5
27.8	48.35	21.0	27.0	39.38	16.1	27.5	39.83	53.4	27.6	53.47	19.8
28.8	49.32	21.0	28.0	39.48	15.8	28.5	39.71	53.7	28.6	53.41	20.1
29.8	50.27	21.0	29.0	39.57	15.5	29.5	39.58	54.0	29.5	53.37	20.4
30.8	51.16	21.0	30.0	39.65	15.2	30.5	39.48	54.3	30.5	53.36	20.7
31.8	52.10	21.0	31.0	39.71	14.9	31.5	39.39	54.5	31.5	53.41	21.0

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	*δ* Ursæ Minoris.		Mean Solar Date.	*λ* Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
July	1 22	+88 46	July	6 53	+87 12	July	18 4	+86 36	July	19 22	+88 59
	s	″		s	″		s	″		s	″
1.8	52.10	21.0	1.0	39.71	14.9	1.5	39.39	54.5	1.5	53.41	21.0
2.8	53.06	21.0	2.0	39.75	14.6	2.5	39.30	54.8	2.5	53.49	21.3
3.8	54.06	21.0	3.0	39.80	14.3	3.5	39.22	55.2	3.5	53.59	21.7
4.8	55.13	21.0	3.9	39.83	14.0	4.5	39.11	55.5	4.5	53.68	22.0
5.8	56.25	21.0	4.9	39.87	13.6	5.5	39.01	55.8	5.5	53.73	22.3
6.8	57.42	21.0	5.9	39.94	13.3	6.5	38.87	56.2	6.5	53.72	22.7
7.8	58.59	21.0	6.9	40.04	12.9	7.5	38.72	56.5	7.5	53.62	23.1
8.8	59.76	21.1	7.9	40.18	12.6	8.5	38.54	56.9	8.5	53.42	23.5
9.8	60.90	21.2	8.9	40.33	12.2	9.5	38.33	57.2	9.5	53.17	23.8
10.7	61.98	21.3	9.9	40.51	11.9	10.5	38.11	57.5	10.5	52.82	24.2
11.7	63.01	21.4	10.9	40.71	11.6	11.5	37.90	57.8	11.5	52.46	24.5
12.7	63.99	21.5	11.9	40.92	11.3	12.4	37.68	58.1	12.5	52.10	24.9
13.7	64.92	21.6	12.9	41.11	11.0	13.4	37.48	58.3	13.5	51.75	25.2
14.7	65.85	21.6	13.9	41.30	10.7	14.4	37.28	58.6	14.5	51.42	25.5
15.7	66.80	21.7	14.9	41.48	10.4	15.4	37.10	58.8	15.5	51.15	25.8
16.7	67.77	21.8	15.9	41.64	10.1	16.4	36.91	59.1	16.5	50.90	26.1
17.7	68.80	21.9	16.9	41.77	9.8	17.4	36.72	59.4	17.5	50.67	26.4
18.7	69.89	21.9	17.9	41.93	9.5	18.4	36.54	59.7	18.5	50.44	26.7
19.7	71.01	22.0	18.9	42.10	9.2	19.4	36.33	60.0	19.5	50.15	27.1
20.7	72.18	22.1	19.9	42.29	8.9	20.4	36.11	60.3	20.5	49.80	27.4
21.7	73.34	22.2	20.9	42.50	8.5	21.4	35.86	60.7	21.5	49.38	27.8
22.7	74.46	22.4	21.9	42.74	8.2	22.4	35.58	61.0	22.5	48.87	28.2
23.7	75.55	22.5	22.9	43.01	7.8	23.4	35.30	61.3	23.5	48.29	28.5
24.7	76.60	22.7	23.9	43.28	7.5	24.4	35.01	61.5	24.5	47.69	28.9
25.7	77.57	22.9	24.9	43.56	7.2	25.4	34.73	61.8	25.5	47.05	29.2
26.7	78.48	23.0	25.9	43.86	7.0	26.4	34.45	62.0	26.5	46.44	29.5
27.7	79.38	23.2	26.9	44.13	6.7	27.4	34.18	62.2	27.5	45.87	29.8
28.7	80.24	23.3	27.9	44.40	6.4	28.4	33.94	62.4	28.5	45.33	30.1
29.7	81.13	23.5	28.9	44.64	6.2	29.4	33.70	62.7	29.5	44.84	30.4
30.7	82.06	23.6	29.9	44.87	5.9	30.4	33.47	62.9	30.5	44.37	30.6
31.7	83.05	23.7	30.9	45.10	5.6	31.4	33.24	63.2	31.5	43.92	31.0
32.7	84.08	23.8	31.9	45.34	5.3	32.4	32.98	63.4	32.5	43.45	31.3

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Aug.	h m 1 23	° ′ +88 46	Aug.	h m 6 53	° ′ +87 11	Aug.	h m 18 4	° ′ +86 37	Aug.	h m 19 22	° ′ +88 59
	s	″		s	″		s	″		s	″
1.7	24.08	23.8	1.9	45.59	65.0	1.4	32.98	3.4	1.5	43.45	31.3
2.7	25.15	24.0	2.9	45.86	64.7	2.4	32.71	3.7	2.4	42.93	31.6
3.7	26.24	24.2	3.9	46.15	64.4	3.4	32.43	4.0	3.4	42.31	32.0
4.7	27.34	24.4	4.9	46.49	64.1	4.4	32.09	4.3	4.4	41.63	32.3
5.7	28.39	24.6	5.9	46.83	63.8	5.4	31.76	4.5	5.4	40.85	32.6
6.7	29.39	24.8	6.9	47.21	63.5	6.4	31.41	4.8	6.4	40.01	33.0
7.7	30.35	25.0	7.9	47.60	63.3	7.4	31.05	5.0	7.4	39.11	33.3
8.7	31.24	25.3	8.9	47.98	63.0	8.4	30.70	5.2	8.4	38.22	33.6
9.7	32.08	25.5	9.9	48.38	62.8	9.4	30.35	5.4	9.4	37.34	33.9
10.7	32.87	25.7	10.9	48.69	62.6	10.4	30.02	5.5	10.4	36.48	34.1
11.7	33.69	26.0	11.9	49.02	62.4	11.4	29.70	5.7	11.4	35.67	34.4
12.7	34.52	26.2	12.9	49.36	62.1	12.4	29.40	5.9	12.4	34.90	34.6
13.7	35.37	26.3	13.9	49.68	61.9	13.4	29.10	6.1	13.4	34.16	34.9
14.7	36.30	26.5	14.9	50.01	61.6	14.4	28.78	6.3	14.4	33.42	35.2
15.6	37.27	26.7	15.9	50.36	61.4	15.4	28.45	6.5	15.4	32.64	35.5
16.6	38.26	27.0	16.9	50.73	61.1	16.3	28.11	6.7	16.4	31.83	35.8
17.6	39.27	27.2	17.9	51.12	60.8	17.3	27.74	6.9	17.4	30.93	36.1
18.6	40.26	27.5	18.9	51.53	60.5	18.3	27.36	7.1	18.4	29.96	36.4
19.6	41.20	27.8	19.9	51.97	60.3	19.3	26.96	7.3	19.4	28.92	36.7
20.6	42.09	28.0	20.9	52.43	60.0	20.3	26.55	7.5	20.4	27.82	37.0
21.6	42.90	28.3	21.9	52.87	59.8	21.3	26.15	7.7	21.4	26.71	37.3
22.6	43.65	28.6	22.9	53.30	59.6	22.3	25.75	7.8	22.4	25.60	37.5
23.6	44.35	28.9	23.9	53.74	59.4	23.3	25.37	7.9	23.4	24.53	37.8
24.6	45.03	29.2	24.8	54.14	59.3	24.3	25.00	8.1	24.4	23.50	38.0
25.6	45.71	29.4	25.8	54.52	59.1	25.3	24.65	8.2	25.4	22.52	38.2
26.6	46.42	29.7	26.8	54.90	58.9	26.3	24.31	8.3	26.4	21.60	38.4
27.6	47.16	29.9	27.8	55.27	58.7	27.3	23.96	8.4	27.4	20.68	38.6
28.6	47.96	30.2	28.8	55.64	58.5	28.3	23.62	8.6	28.4	19.76	38.9
29.6	48.79	30.4	29.8	56.05	58.2	29.3	23.26	8.8	29.4	18.81	39.2
30.6	49.66	30.7	30.8	56.48	58.0	30.3	22.88	9.0	30.4	17.80	39.4
31.6	50.52	31.0	31.8	56.93	57.8	31.3	22.48	9.1	31.4	16.71	39.7
32.6	51.36	31.3	32.8	57.41	57.6	32.3	22.05	9.3	32.4	15.54	40.0

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
Sept.	$1^{h}\ 23^{m}$	$+88^{\circ}\ 46'$	Sept.	$6^{h}\ 53^{m}$	$+87^{\circ}\ 11'$	Sept.	$18^{h}\ 4^{m}$	$+86^{\circ}\ 37'$	Sept.	$19^{h}\ 21^{m}$	$+88^{\circ}\ 59'$
	s	″		s	″		s	″		s	″
1.6	51.36	31.3	1.8	57.41	57.6	1.3	22.05	9.3	1.4	75.54	40.0
2.6	52.14	31.7	2.8	57.90	57.4	2.3	21.65	9.4	2.4	74.29	40.2
3.6	52.86	32.0	3.8	58.42	57.2	3.3	21.17	9.5	3.4	73.02	40.4
4.6	53.53	32.4	4.8	58.93	57.0	4.3	20.73	9.6	4.4	71.70	40.7
5.6	54.13	32.7	5.8	59.42	56.9	5.3	20.31	9.7	5.4	70.40	40.9
6.6	54.68	33.0	6.8	59.91	56.8	6.3	19.88	9.7	6.4	69.14	41.0
7.6	55.23	33.3	7.8	60.38	56.6	7.3	19.48	9.8	7.4	67.91	41.2
8.6	55.77	33.6	8.8	60.82	56.5	8.3	19.09	9.8	8.4	66.73	41.4
9.6	56.36	33.9	9.8	61.26	56.4	9.3	18.70	9.9	9.4	65.59	41.5
10.6	56.97	34.2	10.8	61.70	56.2	10.3	18.33	10.0	10.3	64.46	41.7
11.6	57.63	34.5	11.8	62.16	56.0	11.3	17.94	10.1	11.3	63.34	41.9
12.6	58.34	34.8	12.8	62.62	55.8	12.3	17.53	10.2	12.3	62.17	42.2
13.6	59.04	35.2	13.8	63.12	55.7	13.3	17.12	10.3	13.3	60.93	42.4
14.6	59.76	35.5	14.8	63.64	55.5	14.3	16.67	10.4	14.3	59.64	42.6
15.6	60.42	35.8	15.8	64.18	55.4	15.3	16.21	10.5	15.3	58.28	42.8
16.6	61.03	36.2	16.8	64.72	55.2	16.3	15.75	10.5	16.3	56.84	43.0
17.6	61.58	36.6	17.8	65.27	55.1	17.3	15.28	10.6	17.3	55.40	43.2
18.6	62.04	37.0	18.8	65.80	55.0	18.3	14.82	10.6	18.3	53.96	43.3
19.6	62.44	37.4	19.8	66.33	54.9	19.3	14.38	10.6	19.3	52.55	43.5
20.6	62.80	37.7	20.8	66.84	54.9	20.3	13.96	10.6	20.3	51.18	43.6
21.5	63.16	38.1	21.8	67.30	54.8	21.3	13.56	10.6	21.3	49.87	43.7
22.5	63.54	38.4	22.8	67.77	54.7	22.2	13.16	10.6	22.3	48.63	43.8
23.5	63.93	38.7	23.8	68.23	54.6	23.2	12.79	10.6	23.3	47.42	43.9
24.5	64.37	39.0	24.8	68.68	54.5	24.2	12.41	10.6	24.3	46.22	44.1
25.5	64.86	39.3	25.8	69.15	54.4	25.2	12.00	10.6	25.3	45.00	44.2
26.5	65.37	39.7	26.8	69.64	54.3	26.2	11.60	10.6	26.3	43.74	44.4
27.5	65.90	40.0	27.8	70.16	54.2	27.2	11.17	10.7	27.3	42.42	44.5
28.5	66.40	40.4	28.8	70.71	54.1	28.2	10.73	10.7	28.3	41.02	44.7
29.5	66.84	40.8	29.8	71.26	54.0	29.2	10.27	10.7	29.3	39.55	44.8
30.5	67.24	41.2	30.8	71.83	53.9	30.2	9.79	10.7	30.3	38.03	45.0
31.5	67.56	41.6	31.7	72.42	53.9	31.2	9.33	10.7	31.3	36.47	45.1

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	1 24	+88 46	Oct.	6 54	+87 11	Oct.	18 3	+86 37	Oct.	19 20	+88 59
	s	″		s	″		s	″		s	″
1.5	7.56	41.6	1.7	12.42	53.9	1.2	69.33	10.7	1.3	96.47	45.1
2.5	7.82	42.0	2.7	12.97	53.9	2.2	68.87	10.6	2.3	94.96	45.2
3.5	8.03	42.4	3.7	13.51	53.8	3.2	68.42	10.5	3.3	93.44	45.2
4.5	8.20	42.8	4.7	14.03	53.8	4.2	68.01	10.4	4.3	91.98	45.3
5.5	8.38	43.2	5.7	14.56	53.8	5.2	67.60	10.4	5.3	90.58	45.3
6.5	8.57	43.5	6.7	15.04	53.8	6.2	67.21	10.3	6.3	89.23	45.4
7.5	8.79	43.8	7.7	15.52	53.8	7.2	66.81	10.2	7.3	87.91	45.4
8.5	9.06	44.2	8.7	16.01	53.8	8.2	66.41	10.2	8.3	86.61	45.5
9.5	9.37	44.5	9.7	16.51	53.7	9.2	66.03	10.2	9.3	85.27	45.5
10.5	9.70	44.9	10.7	17.04	53.6	10.2	65.60	10.1	10.3	83.91	45.6
11.5	10.01	45.3	11.7	17.58	53.6	11.2	65.18	10.1	11.3	82.47	45.7
12.5	10.32	45.7	12.7	18.13	53.6	12.2	64.73	10.0	12.3	80.99	45.8
13.5	10.54	46.1	13.7	18.71	53.5	13.2	64.27	10.0	13.3	79.45	45.9
14.5	10.71	46.5	14.7	19.30	53.6	14.2	63.82	9.9	14.3	77.87	46.0
15.5	10.81	46.9	15.7	19.85	53.6	15.2	63.37	9.8	15.3	76.29	46.0
16.5	10.84	47.3	16.7	20.41	53.6	16.2	62.94	9.6	16.2	74.75	46.0
17.5	10.82	47.7	17.7	20.94	53.7	17.2	62.53	9.5	17.2	73.24	46.0
18.5	10.77	48.1	18.7	21.45	53.8	18.2	62.14	9.4	18.2	71.80	46.0
19.5	10.72	48.4	19.7	21.93	53.8	19.2	61.77	9.2	19.2	70.44	46.0
20.5	10.68	48.8	20.7	22.40	53.8	20.2	61.41	9.1	20.2	69.12	45.9
21.5	10.70	49.1	21.7	22.86	53.9	21.2	61.06	9.0	21.2	67.84	45.9
22.5	10.75	49.4	22.7	23.32	53.9	22.2	60.71	8.9	22.2	66.58	45.9
23.5	10.83	49.8	23.7	23.81	53.9	23.2	60.34	8.8	23.2	65.28	45.9
24.5	10.94	50.1	24.7	24.30	53.9	24.2	59.96	8.7	24.2	63.93	46.0
25.5	11.02	50.5	25.7	24.84	54.0	25.2	59.58	8.6	25.2	62.51	46.0
26.5	11.08	50.9	26.7	25.38	54.0	26.2	59.16	8.4	26.2	61.04	46.0
27.5	11.08	51.3	27.7	25.93	54.0	27.2	58.74	8.3	27.2	59.52	46.0
28.4	11.01	51.7	28.7	26.48	54.1	28.1	58.32	8.1	28.2	57.95	46.0
29.4	10.85	52.1	29.7	27.04	54.2	29.1	57.90	8.0	29.2	56.40	45.9
30.4	10.66	52.5	30.7	27.55	54.4	30.1	57.51	7.8	30.2	54.89	45.9
31.4	10.39	52.9	31.7	28.07	54.5	31.1	57.13	7.5	31.2	53.43	45.8
32.4	10.13	53.3	32.7	28.55	54.6	32.1	56.79	7.3	32.2	52.02	45.7

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Nov.	1 23	+88 46	Nov.	6 54	+87 11	Nov.	18 3	+86 37	Nov.	19 20	+88 59
	s	″		s	″		s	″		s	″
1.4	70.13	53.3	1.7	28.55	54.6	1.1	56.79	7.3	1.2	52.02	45.7
2.4	69.87	53.6	2.7	29.01	54.7	2.1	56.45	7.1	2.2	50.70	45.6
3.4	69.65	54.0	3.7	29.46	54.8	3.1	56.11	6.9	3.2	49.41	45.5
4.4	69.45	54.3	4.7	29.90	54.9	4.1	55.80	6.7	4.2	48.15	45.4
5.4	69.31	54.6	5.7	30.35	55.0	5.1	55.46	6.6	5.2	46.89	45.3
6.4	69.18	55.0	6.6	30.83	55.1	6.1	55.13	6.4	6.2	45.61	45.3
7.4	69.06	55.3	7.6	31.31	55.2	7.1	54.79	6.2	7.2	44.28	45.2
8.4	68.94	55.7	8.6	31.82	55.3	8.1	54.41	6.1	8.2	42.91	45.2
9.4	68.74	56.1	9.6	32.31	55.4	9.1	54.05	5.9	9.2	41.48	45.1
10.4	68.51	56.4	10.6	32.84	55.5	10.1	53.69	5.7	10.2	40.02	45.0
11.4	68.18	56.8	11.6	33.35	55.7	11.1	53.32	5.4	11.2	38.55	44.9
12.4	67.79	57.2	12.6	33.85	55.9	12.1	52.97	5.2	12.2	37.12	44.8
13.4	67.34	57.6	13.6	34.32	56.0	13.1	52.63	4.9	13.2	35.75	44.7
14.4	66.83	57.9	14.6	34.77	56.2	14.1	52.33	4.6	14.2	34.42	44.5
15.4	66.33	58.2	15.6	35.18	56.4	15.1	52.05	4.4	15.2	33.19	44.3
16.4	65.86	58.6	16.6	35.57	56.6	16.1	51.79	4.1	16.2	32.02	44.2
17.4	65.40	58.8	17.6	35.95	56.8	17.1	51.55	3.9	17.2	30.91	44.0
18.4	64.99	59.1	18.6	36.32	57.0	18.1	51.29	3.6	18.2	29.81	43.9
19.4	64.64	59.4	19.6	36.71	57.1	19.1	51.04	3.4	19.2	28.72	43.7
20.4	64.28	59.7	20.6	37.12	57.2	20.1	50.78	3.2	20.1	27.59	43.6
21.4	63.94	60.0	21.6	37.54	57.4	21.1	50.49	3.0	21.1	26.44	43.5
22.4	63.56	60.4	22.6	37.98	57.5	22.1	50.21	2.7	22.1	25.21	43.4
23.4	63.14	60.7	23.6	38.42	57.7	23.1	49.91	2.5	23.1	23.94	43.2
24.4	62.66	61.1	24.6	38.87	57.9	24.1	49.62	2.2	24.1	22.64	43.1
25.4	62.10	61.4	25.6	39.33	58.1	25.1	49.33	1.9	25.1	21.34	42.9
26.4	61.47	61.7	26.6	39.75	58.4	26.1	49.05	1.6	26.1	20.08	42.7
27.4	60.81	62.0	27.6	40.15	58.6	27.1	48.80	1.3	27.1	18.86	42.5
28.4	60.11	62.3	28.6	40.53	58.9	28.1	48.56	1.0	28.1	17.72	42.3
29.4	59.42	62.6	29.6	40.89	59.1	29.1	48.37	0.7	29.1	16.65	42.0
30.4	58.74	62.9	30.6	41.20	59.4	30.1	48.16	0.4	30.1	15.66	41.8
31.4	58.11	63.1	31.6	41.52	59.6	31.1	47.98	0.1	31.1	14.70	41.6

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Minoris. (*Polaris.*)		Mean Solar Date.	51 Cephei (Hev.)		Mean Solar Date.	δ Ursæ Minoris.		Mean Solar Date.	λ Ursæ Minoris.	
	Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*		Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	1 23	+88 47	Dec.	6 54	+87 11	Dec.	18 3	+86 36	Dec.	19 19	+88 59
	s	″		s	″		s	″		s	″
1.4	58.11	3.1	1.6	41.52	59.6	1.1	47.98	60.1	1.1	74.70	41.6
2.4	57.53	3.4	2.6	41.85	59.8	2.1	47.81	59.8	2.1	73.78	41.4
3.3	56.96	3.6	3.6	42.17	60.0	3.1	47.61	59.5	3.1	72.84	41.2
4.3	56.43	3.9	4.6	42.51	60.2	4.0	47.41	59.3	4.1	71.87	41.0
5.3	55.89	4.2	5.6	42.86	60.4	5.0	47.20	59.0	5.1	70.87	40.8
6.3	55.31	4.4	6.6	43.22	60.7	6.0	46.98	58.7	6.1	69.81	40.6
7.3	54.69	4.7	7.6	43.60	60.9	7.0	46.76	58.4	7.1	68.72	40.4
8.3	53.99	5.0	8.6	43.96	61.2	8.0	46.54	58.1	8.1	67.63	40.2
9.3	53.22	5.3	9.6	44.31	61.4	9.0	46.35	57.8	9.1	66.56	39.9
10.3	52.40	5.6	10.6	44.62	61.7	10.0	46.16	57.4	10.1	65.56	39.7
11.3	51.51	5.8	11.6	44.92	62.0	11.0	46.02	57.1	11.1	64.62	39.4
12.3	50.62	6.1	12.5	45.18	62.3	12.0	45.90	56.7	12.1	63.76	39.1
13.3	49.75	6.3	13.5	45.41	62.6	13.0	45.80	56.4	13.1	63.00	38.8
14.3	48.90	6.4	14.5	45.62	62.9	14.0	45.70	56.1	14.1	62.30	38.5
15.3	48.10	6.6	15.5	45.83	63.2	15.0	45.63	55.8	15.1	61.65	38.2
16.3	47.33	6.8	16.5	46.04	63.4	16.0	45.55	55.4	16.1	61.01	38.0
17.3	46.61	7.0	17.5	46.25	63.7	17.0	45.46	55.1	17.1	60.37	37.8
18.3	45.89	7.1	18.5	46.46	63.9	18.0	45.36	54.9	18.1	59.70	37.5
19.3	45.18	7.3	19.5	46.72	64.2	19.0	45.25	54.6	19.1	58.98	37.3
20.3	44.42	7.6	20.5	46.98	64.4	20.0	45.14	54.3	20.1	58.20	37.0
21.3	43.61	7.8	21.5	47.24	64.7	21.0	45.01	53.9	21.1	57.40	36.8
22.3	42.75	8.0	22.5	47.49	65.0	22.0	44.91	53.6	22.1	56.60	36.5
23.3	41.81	8.2	23.5	47.73	65.3	23.0	44.81	53.2	23.1	55.84	36.2
24.3	40.82	8.4	24.5	47.95	65.7	24.0	44.72	52.9	24.1	55.11	35.9
25.3	39.80	8.5	25.5	48.13	66.0	25.0	44.66	52.5	25.1	54.46	35.6
26.3	38.78	8.7	26.5	48.28	66.3	26.0	44.63	52.1	26.0	53.89	35.2
27.3	37.80	8.8	27.5	48.42	66.7	27.0	44.62	51.8	27.0	53.40	34.9
28.3	36.83	8.9	28.5	48.53	67.0	28.0	44.63	51.4	28.0	52.98	34.6
29.3	35.93	9.0	29.5	48.64	67.3	28.9	44.63	51.1	29.0	52.59	34.3
30.3	35.08	9.1	30.5	48.75	67.6	29.9	44.64	50.8	30.0	52.22	34.0
31.3	34.25	9.2	31.5	48.87	67.8	30.9	44.64	50.5	31.0	51.84	33.7
32.3	33.43	9.4	32.5	49.00	68.1	31.9	44.62	50.2	32.0	51.42	33.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.		33 Piscium.		*α* Andromedæ.		*β* Cassiopeiæ.		22 Andromedæ.		*γ* Pegasi. (*Algenib.*)	
		Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
		h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
		0 0	− 6 15	0 3	+28 32	0 3	+58 35	0 5	+45 30	0 8	+14 37
		s	″	s	″	s	″	s	″	s	″
Jan.	0.2	13.87 .11	57.8 0.6	13.95 .14	33.3 0.8	51.29 .31	77.0 0.6	8.25 .21	77.1 0.7	6.07 .12	50.1 0.8
	10.2	13.76 .10	58.3 0.5	13.82 .14	32.4 1.0	50.98 .30	76.2 1.0	8.05 .20	76.2 1.1	5.95 .11	49.2 0.9
	20.2	13.66 .09	58.8 0.4	13.68 .13	31.2 1.3	50.69 .28	74.9 1.5	7.86 .18	74.9 1.5	5.84 .11	48.3 1.0
	30.2	13.58 .08	59.1 0.3	13.57 .11	29.8 1.5	50.43 .25	73.2 2.0	7.68 .16	73.3 1.8	5.74 .09	47.2 1.1
Feb.	9.1	13.50 .06	59.3 0.1	13.47 .09	28.2 1.6	50.20 .21	71.0 2.4	7.53 .13	71.3 2.1	5.66 .07	46.2 1.1
	19.1	13.45 .04	59.3 0.1	13.39 .06	26.6 1.7	50.02 .15	68.6 2.6	7.42 .09	69.1 2.3	5.59 .05	45.1 1.0
Mar.	1.1	13.43 .01	59.1 0.3	13.35 .03	24.9 1.6	49.90 .08	65.9 2.7	7.34 .05	66.8 2.3	5.56 .02	44.2 0.9
	11.0	13.43 .02	58.7 0.5	13.34 .01	23.4 1.5	49.85 .01	63.2 2.7	7.32 .00	64.5 2.3	5.55 .01	43.4 0.7
	21.0	13.47 .06	58.0 0.8	13.38 .05	21.9 1.3	49.88 .06	60.5 2.7	7.35 .06	62.3 2.1	5.58 .05	42.7 0.5
	31.0	13.55 .09	57.2 1.0	13.46 .10	20.7 1.1	49.98 .14	57.9 2.5	7.43 .12	60.2 1.9	5.66 .09	42.3 0.3
Apr.	10.0	13.66 .13	56.0 1.2	13.59 .15	19.8 0.8	50.16 .22	55.6 2.2	7.58 .17	58.5 1.6	5.77 .13	42.2 0.0
	19.9	13.82 .17	54.7 1.5	13.76 .20	19.2 0.4	50.42 .29	53.6 1.8	7.78 .23	57.0 1.2	5.92 .17	42.4 0.3
	29.9	14.01 .21	53.1 1.7	13.98 .24	19.0 0.0	50.75 .36	52.0 1.4	8.04 .28	56.0 0.8	6.12 .21	42.9 0.7
May	9.9	14.23 .24	51.4 1.8	14.23 .27	19.2 0.4	51.14 .42	50.9 0.9	8.34 .33	55.4 0.4	6.35 .25	43.7 1.0
	19.9	14.49 .27	49.5 1.9	14.52 .30	19.8 0.8	51.58 .46	50.3 0.3	8.69 .36	55.3 0.1	6.61 .28	44.8 1.3
	29.8	14.77 .29	47.5 2.0	14.84 .32	20.7 1.1	52.06 .49	50.2 0.2	9.06 .39	55.6 0.6	6.90 .30	46.2 1.5
June	8.8	15.07 .31	45.4 2.1	15.17 .34	22.0 1.5	52.56 .51	50.7 0.7	9.46 .40	56.5 1.1	7.21 .31	47.8 1.7
	18.8	15.38 .31	43.4 2.0	15.52 .34	23.6 1.8	53.08 .52	51.6 1.2	9.87 .41	57.7 1.5	7.53 .32	49.6 1.9
	28.7	15.70 .31	41.3 2.0	15.86 .34	25.5 2.0	53.59 .51	53.1 1.7	10.27 .40	59.4 1.9	7.85 .32	51.6 2.1
July	8.7	16.00 .30	39.4 1.8	16.20 .33	27.7 2.2	54.09 .49	55.0 2.1	10.67 .38	61.4 2.2	8.16 .31	53.7 2.1
	18.7	16.29 .28	37.7 1.7	16.51 .31	30.0 2.4	54.56 .46	57.3 2.5	11.04 .36	63.8 2.5	8.46 .29	55.9 2.1
	18.7	16.56 .26	36.1 1.5	16.81 .28	32.4 2.5	54.99 .41	60.0 2.8	11.39 .33	66.4 2.7	8.74 .27	58.0 2.1
Aug.	7.6	16.81 .23	34.8 1.2	17.07 .25	34.9 2.5	55.38 .36	62.9 3.0	11.70 .29	69.2 2.9	8.99 .24	60.1 2.0
	17.6	17.02 .19	33.7 0.9	17.30 .21	37.4 2.5	55.70 .30	66.0 3.2	11.96 .24	72.2 3.0	9.21 .20	62.1 1.9
	27.6	17.19 .15	32.9 0.7	17.48 .17	39.8 2.4	55.98 .24	69.4 3.3	12.18 .19	75.2 3.0	9.39 .16	63.9 1.8
Sept.	6.6	17.33 .11	32.4 0.4	17.63 .13	42.2 2.3	56.18 .18	72.7 3.4	12.35 .15	78.2 3.0	9.54 .13	65.6 1.6
	16.5	17.42 .08	32.1 0.1	17.74 .09	44.4 2.1	56.33 .11	76.1 3.4	12.47 .10	81.2 2.9	9.64 .09	67.1 1.4
	26.5	17.48 .04	32.1 0.1	17.81 .05	46.4 1.9	56.41 .05	79.4 3.3	12.55 .05	84.0 2.8	9.71 .05	68.3 1.1
Oct.	6.5	17.51 .00	32.4 0.3	17.83 .01	48.2 1.7	56.43 .01	82.6 3.1	12.58 .00	86.7 2.6	9.75 .02	69.3 0.9
	16.4	17.49 .03	32.8 0.5	17.83 .02	49.8 1.5	56.38 .07	85.6 2.9	12.56 .04	89.2 2.3	9.74 .01	70.1 0.7
	26.4	17.45 .05	33.4 0.6	17.79 .05	51.2 1.2	56.29 .12	88.4 2.6	12.50 .07	91.4 2.0	9.72 .04	70.7 0.5
Nov.	5.4	17.39 .07	34.0 0.7	17.72 .08	52.2 0.9	56.14 .17	90.8 2.3	12.40 .11	93.3 1.7	9.66 .06	71.1 0.2
	15.4	17.31 .09	34.8 0.8	17.63 .10	53.0 0.6	55.95 .21	92.9 1.9	12.28 .14	94.8 1.3	9.59 .08	71.2 0.0
	25.3	17.21 .10	35.6 0.8	17.52 .18	53.4 0.3	55.72 .25	94.5 1.4	12.13 .16	95.9 0.9	9.50 .10	71.1 0.2
Dec.	5.3	17.10 .11	36.4 0.8	17.40 .13	53.6 0.0	55.45 .28	95.6 0.9	11.95 .18	96.6 0.5	9.39 .11	70.8 0.4
	15.3	16.99 .11	37.2 0.7	17.26 .14	53.4 0.3	55.16 .30	96.2 0.3	11.76 .20	96.9 0.0	9.28 .12	70.4 0.6
	25.3	16.88 .11	38.0 0.6	17.12 .14	52.9 0.6	54.86 .31	96.3 0.2	11.56 .20	96.7 0.4	9.16 .12	69.7 0.7
	35.2	16.76 .11	38.6 0.6	16.98 .14	52.1 0.9	54.55 .31	95.8 0.7	11.36 .21	96.1 0.9	9.04 .12	68.9 0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Andromedæ.		ι Ceti.		44 Piscium.		β Hydri.		12 Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 0 13	° ′ +36 13	h m 0 14	° ′ − 9 22	h m 0 20	° ′ + 1 23	h m 0 20	° ′ −77 48	h m 0 24	° ′ − 4 30
	s	″	s	″	s	″	s	″	s	″
Jan. 0.2	7.13 .16	68.6 0.7	20.89 .11	39.7 0.6	17.55 .11	15.0 0.7	29.81 .95	76.3 0.8	57.12 .12	31.8 0.7
10.2	6.97 .16	67.7 1.0	20.78 .11	40.2 0.5	17.44 .11	14.3 0.7	28.88 .90	75.3 1.3	57.01 .11	32.5 0.6
20.2	6.81 .15	66.5 1.3	20.67 .10	40.6 0.4	17.33 .10	13.6 0.6	28.01 .83	73.6 1.9	56.90 .11	33.0 0.5
30.2	6.67 .13	65.0 1.6	20.57 .09	40.9 0.2	17.23 .09	13.0 0.6	27.23 .73	71.4 2.4	56.80 .10	33.4 0.4
Feb. 9.1	6.54 .11	63.3 1.8	20.49 .07	40.9 0.0	17.14 .08	12.5 0.5	26.55 .62	68.8 2.8	56.71 .08	33.7 0.2
19.1	6.44 .08	61.5 1.9	20.42 .05	40.8 0.3	17.08 .06	12.1 0.3	25.99 .49	65.8 3.2	56.64 .06	33.8 0.0
Mar. 1.1	6.38 .04	59.5 1.9	20.38 .02	40.4 0.5	17.03 .03	11.8 0.1	25.57 .35	62.4 3.5	56.59 .03	33.7 0.2
11.1	6.36 .00	57.6 1.9	20.38 .01	39.8 0.7	17.02 .00	11.8 0.1	25.29 .20	58.8 3.7	56.57 .00	33.4 0.4
21.0	6.38 .05	55.8 1.7	20.40 .04	39.0 0.9	17.04 .04	12.0 0.3	25.16 .05	55.0 3.8	56.58 .03	32.9 0.6
31.0	6.45 .10	54.2 1.5	20.46 .08	37.9 1.2	17.09 .08	12.4 0.5	25.19 .10	51.2 3.8	56.63 .07	32.1 0.9
Apr. 10.0	6.58 .15	52.9 1.2	20.56 .12	36.6 1.4	17.19 .12	13.0 0.8	25.37 .26	47.4 3.8	56.73 .11	31.1 1.1
19.9	6.75 .20	51.8 0.8	20.70 .16	35.1 1.6	17.32 .16	13.9 1.0	25.72 .41	43.6 3.6	56.85 .15	29.9 1.4
29.9	6.97 .24	51.2 0.4	20.88 .20	33.4 1.8	17.50 .19	15.1 1.3	26.21 .56	40.1 3.4	57.02 .19	28.4 1.6
May 9.9	7.24 .28	51.0 0.0	21.10 .23	31.5 1.9	17.72 .23	16.5 1.5	26.84 .70	36.8 3.1	57.23 .23	26.8 1.7
19.9	7.54 .32	51.2 0.4	21.34 .26	29.5 2.0	17.96 .26	18.1 1.7	27.60 .82	33.9 2.8	57.47 .26	25.0 1.9
29.8	7.87 .34	51.8 0.8	21.62 .28	27.4 2.1	18.24 .28	19.9 1.8	28.47 .91	31.3 2.4	57.74 .28	23.0 2.0
June 8.8	8.23 .36	52.8 1.2	21.92 .30	25.3 2.1	18.53 .30	21.8 1.9	29.43 .99	29.2 1.9	58.03 .30	21.0 2.0
18.8	8.59 .37	54.2 1.6	22.22 .31	23.2 2.1	18.84 .31	23.8 2.0	30.46 1.05	27.5 1.4	58.34 .31	18.9 2.0
28.8	8.96 .36	55.9 1.9	22.54 .31	21.2 2.0	19.15 .31	25.8 2.0	31.53 1.08	26.4 0.8	58.65 .31	16.9 2.0
July 8.7	9.32 .35	58.0 2.2	22.85 .31	19.4 1.8	19.46 .30	27.8 2.0	32.60 1.07	25.9 0.2	58.96 .30	14.9 1.9
18.7	9.66 .33	60.2 2.4	23.14 .29	17.6 1.6	19.75 .29	29.7 1.9	33.66 1.04	26.0 0.3	59.26 .29	13.1 1.7
28.7	9.98 .30	62.7 2.5	23.42 .27	16.2 1.4	20.03 .27	31.5 1.7	34.67 .97	26.6 0.9	59.54 .27	11.5 1.5
Aug. 7.6	10.26 .27	65.3 2.6	23.68 .24	14.9 1.1	20.29 .24	33.1 1.5	35.60 .88	27.7 1.4	59.80 .24	10.0 1.3
17.6	10.51 .23	68.0 2.7	23.90 .21	14.0 0.8	20.51 .21	34.5 1.3	36.42 .76	29.4 1.9	60.02 .21	8.9 1.0
27.6	10.72 .19	70.7 2.7	24.09 .17	13.3 0.5	20.70 .17	35.7 1.1	37.10 .62	31.6 2.3	60.22 .18	8.0 0.8
Sept. 6.6	10.89 .14	73.3 2.6	24.24 .13	13.0 0.2	20.85 .14	36.7 0.8	37.62 .45	34.1 2.7	60.38 .14	7.3 0.5
16.5	11.01 .10	75.9 2.5	24.35 .09	12.9 0.1	20.97 .10	37.4 0.6	37.97 .26	37.0 3.0	60.50 .10	7.0 0.2
26.5	11.09 .06	78.3 2.3	24.42 .05	13.1 0.3	21.05 .07	37.9 0.3	38.13 .07	40.0 3.1	60.58 .07	6.9 0.0
Oct. 6.5	11.13 .02	80.6 2.1	24.46 .02	13.5 0.5	21.09 .03	38.1 0.1	38.10 .12	43.1 3.1	60.63 .03	7.0 0.2
16.5	11.13 .02	82.6 1.9	24.46 .01	14.1 0.7	21.10 .01	38.1 0.1	37.88 .31	46.1 3.0	60.64 .00	7.4 0.4
26.4	11.10 .05	84.4 1.6	24.43 .04	14.9 0.8	21.08 .03	37.9 0.3	37.49 .48	49.0 2.8	60.62 .03	7.9 0.6
Nov. 5.4	11.03 .08	85.8 1.3	24.38 .06	15.8 0.9	21.04 .05	37.6 0.4	36.93 .63	51.7 2.5	60.58 .05	8.5 0.7
15.4	10.94 .11	87.0 1.0	24.30 .08	16.7 0.9	20.98 .07	37.1 0.5	36.24 .76	53.9 2.0	60.52 .07	9.3 0.8
25.3	10.82 .13	87.8 0.6	24.21 .10	17.6 0.9	20.90 .09	36.5 0.6	35.42 .86	55.6 1.5	60.44 .09	10.1 0.8
Dec. 5.3	10.69 .14	88.2 0.3	24.10 .11	18.6 0.9	20.80 .10	35.8 0.7	34.53 .93	56.8 0.9	60.34 .10	10.9 0.8
15.3	10.54 .15	88.3 0.1	23.99 .12	19.4 0.8	20.69 .11	35.1 0.7	33.59 .96	57.4 0.3	60.24 .11	11.8 0.8
25.3	10.38 .16	88.0 0.5	23.87 .12	20.2 0.7	20.58 .11	34.4 0.7	32.62 .96	57.4 0.3	60.12 .12	12.5 0.8
35.2	10.21 .17	87.4 0.8	23.76 .12	20.9 0.6	20.47 .12	33.6 0.8	31.68 .94	56.8 1.0	60.00 .12	13.2 0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	π Andromedæ.		α Cassiopeiæ.		β Ceti.		21 Cassiopeiæ.		o Cassiopeiæ.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 0 31	° ′ +33 10	h m 0 34	° ′ +55 59	h m 0 38	° ′ −18 31	h m 0 39	° ′ +74 26	h m 0 39	° ′ +47 44
	s	″	s	″	s	″	s	″	s	″
Jan. 0.3	33.45 .15	24.5 0.6	51.12 .28	42.9 0.2	35.23 .13	68.8 0.7	4.20 .69	55.2 0.3	10.36 .21	34.3 0.3
10.2	33.30 .15	23.8 0.9	50.84 .28	42.4 0.7	35.10 .13	69.3 0.4	3.50 .70	55.1 0.4	10.15 .22	33.8 0.7
20.2	33.14 .15	22.8 1.2	50.56 .27	41.5 1.2	34.98 .12	69.5 0.1	2.81 .68	54.4 1.0	9.93 .21	32.8 1.2
30.2	33.00 .14	21.4 1.4	50.30 .25	40.0 1.6	34.86 .11	69.5 0.1	2.15 .63	53.2 1.5	9.72 .20	31.5 1.6
Feb. 9.1	32.87 .12	19.9 1.6	50.06 .22	38.2 2.0	34.75 .10	69.2 0.4	1.56 .56	51.4 2.0	9.54 .18	29.7 1.9
19.1	32.76 .09	18.3 1.7	49.86 .18	36.0 2.3	34.66 .08	68.7 0.7	1.04 .46	49.1 2.4	9.38 .14	27.7 2.1
Mar. 1.1	32.69 .06	16.5 1.7	49.70 .13	33.6 2.5	34.59 .05	67.8 1.0	0.64 .34	46.5 2.7	9.26 .10	25.6 2.2
11.1	32.64 .02	14.8 1.7	49.61 .06	31.1 2.6	34.55 .02	66.8 1.2	0.38 .20	43.7 2.9	9.18 .05	23.3 2.3
21.0	32.65 .03	13.2 1.6	49.59 .01	28.5 2.5	34.55 .01	65.4 1.5	0.25 .05	40.7 3.0	9.16 .01	21.0 2.2
31.0	32.70 .07	11.7 1.4	49.63 .08	26.0 2.4	34.58 .05	63.8 1.7	0.28 .11	37.7 3.0	9.20 .07	18.9 2.1
Apr. 10.0	32.80 .12	10.5 1.1	49.76 .16	23.7 2.2	34.66 .10	62.0 1.9	0.46 .26	34.8 2.8	9.31 .13	16.9 1.8
20.0	32.95 .17	9.6 0.8	49.95 .23	21.7 1.9	34.77 .14	60.0 2.1	0.80 .41	32.1 2.5	9.47 .19	15.2 1.5
29.9	33.14 .22	9.0 0.4	50.22 .30	20.0 1.5	34.93 .18	57.9 2.2	1.28 .54	29.7 2.2	9.70 .25	13.9 1.2
May 9.9	33.39 .26	8.8 0.0	50.55 .36	18.7 1.0	35.13 .22	55.6 2.3	1.88 .66	27.8 1.7	9.98 .31	12.9 0.8
19.9	33.67 .30	9.0 0.4	50.94 .41	17.9 0.6	35.36 .25	53.2 2.4	2.59 .76	26.3 1.2	10.31 .35	12.4 0.3
29.8	33.98 .33	9.5 0.8	51.37 .45	17.6 0.1	35.62 .28	50.9 2.3	3.39 .84	25.3 0.7	10.68 .39	12.4 0.2
June 8.8	34.32 .35	10.5 1.1	51.83 .48	17.7 0.4	35.92 .30	48.6 2.3	4.25 .88	24.8 0.2	11.08 .41	12.8 0.6
18.8	34.67 .36	11.8 1.5	52.31 .49	18.4 0.9	36.23 .31	46.4 2.2	5.15 .91	25.0 0.4	11.49 .42	13.6 1.1
28.8	35.03 .36	13.5 1.8	52.80 .49	19.6 1.4	36.54 .32	44.3 2.0	6.07 .91	25.6 0.9	11.92 .42	14.9 1.5
July 8.7	35.39 .35	15.4 2.0	53.29 .48	21.2 1.8	36.86 .32	42.5 1.7	6.97 .89	26.8 1.4	12.34 .41	16.6 1.8
18.7	35.73 .33	17.5 2.2	53.76 .46	23.1 2.2	37.18 .31	40.9 1.4	7.85 .85	28.4 1.9	12.74 .40	18.6 2.2
28.7	36.05 .31	19.8 2.4	54.19 .42	25.5 2.5	37.47 .29	39.6 1.1	8.68 .79	30.6 2.4	13.12 .37	20.9 2.5
Aug. 7.7	36.34 .28	22.3 2.5	54.60 .38	28.1 2.8	37.75 .26	38.6 0.8	9.43 .72	33.1 2.7	13.48 .34	23.5 2.7
17.6	36.60 .24	24.8 2.5	54.95 .33	31.0 3.0	37.99 .23	38.0 0.4	10.11 .63	36.0 3.0	13.79 .30	26.2 2.8
27.6	36.83 .20	27.3 2.5	55.26 .28	34.1 3.1	38.20 .19	37.8 0.1	10.69 .54	39.2 3.3	14.06 .25	29.1 2.9
Sept. 6.6	37.01 .16	29.7 2.4	55.51 .22	37.2 3.2	38.38 .16	37.8 0.3	11.16 .42	42.6 3.5	14.29 .20	32.0 2.9
16.5	37.16 .12	32.1 2.3	55.71 .17	40.5 3.2	38.52 .12	38.3 0.6	11.53 .31	46.2 3.6	14.47 .15	34.9 2.9
26.5	37.26 .08	34.4 2.2	55.84 .11	43.6 3.2	38.61 .08	39.0 0.9	11.77 .19	49.8 3.7	14.60 .11	37.8 2.8
Oct. 6.5	37.32 .04	36.5 2.0	55.92 .05	46.8 3.1	38.67 .04	40.0 1.1	11.90 .07	53.4 3.6	14.68 .06	40.6 2.7
16.5	37.35 .01	38.3 1.8	55.94 .01	49.7 2.9	38.70 .00	41.2 1.3	11.91 .05	57.0 3.5	14.71 .01	43.2 2.6
26.4	37.34 .02	39.9 1.5	55.91 .06	52.5 2.6	38.68 .03	42.5 1.4	11.80 .17	60.4 3.3	14.70 .03	45.6 2.3
Nov. 5.4	37.30 .05	41.3 1.2	55.83 .10	55.0 2.3	38.64 .05	43.8 1.4	11.58 .28	63.6 3.0	14.65 .07	47.8 2.0
15.4	37.23 .08	42.4 0.9	55.71 .15	57.1 2.0	38.58 .08	45.2 1.4	11.25 .38	66.5 2.7	14.56 .10	49.6 1.7
25.4	37.13 .10	43.2 0.6	55.54 .19	58.9 1.6	38.49 .10	46.6 1.3	10.82 .48	69.0 2.3	14.43 .14	51.0 1.3
Dec. 5.3	37.02 .12	43.7 0.3	55.33 .22	60.3 1.1	38.39 .11	47.8 1.2	10.30 .56	71.0 1.8	14.28 .17	52.1 0.9
15.3	36.89 .14	43.8 0.1	55.09 .25	61.1 0.6	38.27 .12	48.9 1.0	9.70 .63	72.5 1.2	14.10 .20	52.7 0.4
25.3	36.74 .15	43.6 0.4	54.83 .27	61.5 0.1	38.14 .13	49.8 0.8	9.04 .67	73.4 0.6	13.90 .21	52.9 0.1
35.2	36.59 .15	43.0 0.7	54.55 .28	61.3 0.4	38.01 .13	50.4 0.7	8.35 .70	73.7 0.0	13.68 .22	52.6 0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Piscium.		γ Cassiopeiæ.		μ Andromedæ.		43 Cephei (H.)		ε Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 0 43	° ′ + 7 2	h m 0 50	° ′ +60 10	h m 0 51	° ′ +37 57	h m 0 54	° ′ +85 43	h m 0 57	° ′ + 7 21
	s	″	s	″	s	″	s	″	s	″
Jan. 0.3	30.74 .11	34.7 0.7	41.80 .32	54.3 0.0	13.40 .17	42.8 0.4	67.31 2.71	41.2 0.8	46.37 .11	13.8 0.7
10.2	30.63 .12	34.0 0.7	41.48 .33	54.1 0.5	13.24 .17	42.3 0.7	64.56 2.77	41.6 0.1	46.26 .12	13.1 0.7
20.2	30.51 .12	33.2 0.8	41.15 .33	53.4 1.0	13.07 .17	41.4 1.0	61.81 2.73	41.4 0.6	46.14 .12	12.4 0.7
30.2	30.40 .11	32.5 0.7	40.83 .31	52.1 1.5	12.90 .16	40.2 1.3	59.15 2.57	40.5 1.2	46.02 .12	11.6 0.7
Feb. 9.2	30.30 .09	31.8 0.7	40.53 .28	50.4 1.9	12.74 .15	38.7 1.6	56.70 2.32	39.0 1.8	45.91 .11	11.0 0.7
19.1	30.21 .07	31.1 0.6	40.28 .23	48.3 2.3	12.61 .12	37.0 1.8	54.54 1.97	37.0 2.2	45.81 .09	10.3 0.6
Mar. 1.1	30.15 .05	30.6 0.5	40.07 .17	46.0 2.5	12.50 .09	35.2 1.8	52.78 1.54	34.5 2.6	45.73 .06	9.8 0.5
11.1	30.11 .02	30.2 0.3	39.94 .10	43.4 2.6	12.43 .05	33.4 1.8	51.49 1.04	31.7 2.9	45.68 .03	9.4 0.3
21.0	30.10 .01	30.1 0.1	39.87 .02	40.8 2.7	12.41 .00	31.6 1.8	50.72 .51	28.7 3.1	45.66 .00	9.3 0.1
31.0	30.14 .05	30.1 0.2	39.89 .06	38.1 2.6	12.44 .05	29.9 1.6	50.48 .05	25.6 3.1	45.68 .04	9.3 0.1
Apr. 10.0	30.21 .10	30.4 0.4	39.99 .14	35.6 2.4	12.52 .11	28.3 1.4	50.81 .60	22.5 3.1	45.74 .08	9.5 0.4
20.0	30.33 .14	30.9 0.7	40.18 .23	33.4 2.1	12.65 .16	27.1 1.1	51.68 1.13	19.5 2.9	45.85 .12	10.0 0.6
29.9	30.49 .18	31.7 0.9	40.44 .31	31.4 1.8	12.84 .21	26.2 0.8	53.05 1.61	16.8 2.6	45.99 .17	10.8 0.9
May 9.9	30.69 .22	32.8 1.2	40.78 .38	29.8 1.4	13.08 .26	25.6 0.4	54.88 2.04	14.4 2.2	46.18 .21	11.8 1.1
19.9	30.92 .25	34.1 1.4	41.19 .44	28.7 0.9	13.36 .30	25.4 0.0	57.10 2.40	12.4 1.7	46.40 .24	13.1 1.4
29.9	31.19 .28	35.7 1.6	41.65 .48	28.1 0.4	13.68 .33	25.7 0.4	59.64 2.69	10.9 1.2	46.66 .27	14.6 1.6
June 8.8	31.48 .30	37.4 1.8	42.15 .52	27.9 0.1	14.02 .36	26.3 0.8	62.43 2.88	10.0 0.7	46.94 .29	16.2 1.7
18.8	31.78 .31	39.2 1.9	42.68 .54	28.3 0.6	14.39 .37	27.3 1.2	65.38 3.01	9.6 0.1	47.24 .31	18.0 1.9
28.8	32.09 .31	41.2 2.0	43.22 .54	29.1 1.1	14.76 .38	28.7 1.5	68.42 3.05	9.7 0.4	47.55 .31	19.9 1.9
July 8.7	32.41 .31	43.1 2.0	43.76 .53	30.5 1.5	15.14 .37	30.4 1.8	71.46 3.02	10.4 1.0	47.87 .31	21.9 1.9
18.7	32.71 .30	45.1 1.9	44.28 .51	32.2 1.9	15.50 .36	32.4 2.1	74.44 2.92	11.6 1.5	48.17 .30	23.8 1.9
28.7	33.00 .28	47.0 1.8	44.78 .48	34.4 2.3	15.85 .34	34.6 2.3	77.28 2.75	13.4 2.0	48.47 .28	25.7 1.8
Aug. 7.7	33.27 .25	48.8 1.7	45.24 .44	36.8 2.6	16.17 .31	37.0 2.4	79.93 2.54	15.6 2.4	48.74 .26	27.5 1.7
17.6	33.51 .22	50.4 1.5	45.66 .39	39.6 2.9	16.46 .27	39.4 2.5	82.33 2.26	18.2 2.8	48.99 .23	29.1 1.5
27.6	33.72 .19	51.9 1.3	46.02 .34	42.6 3.1	16.72 .23	42.0 2.6	84.43 1.94	21.2 3.1	49.21 .20	30.5 1.3
Sept. 6.6	33.89 .16	53.1 1.1	46.33 .28	45.8 3.2	16.93 .19	44.5 2.5	86.20 1.59	24.5 3.4	49.40 .17	31.8 1.1
16.5	34.03 .12	54.1 0.9	46.58 .21	49.0 3.3	17.11 .15	47.1 2.5	87.60 1.20	28.0 3.6	49.55 .14	32.8 0.9
26.5	34.14 .09	54.9 0.7	46.76 .15	52.3 3.3	17.24 .11	49.5 2.4	88.59 .79	31.7 3.7	49.67 .10	33.6 0.7
Oct. 6.5	34.21 .05	55.4 0.4	46.88 .09	55.5 3.2	17.33 .07	51.8 2.2	89.17 .36	35.5 3.8	49.76 .07	34.1 0.5
16.5	34.24 .02	55.8 0.2	46.93 .02	58.7 3.1	17.39 .03	53.9 2.0	89.30 .08	39.2 3.7	49.81 .04	34.4 0.2
26.5	34.25 .01	55.9 0.0	46.92 .04	61.6 2.9	17.40 .01	55.8 1.8	89.00 .53	42.9 3.6	49.83 .01	34.6 0.0
Nov. 5.4	34.23 .03	55.8 0.2	46.86 .09	64.4 2.6	17.38 .04	57.5 1.6	88.24 .98	46.5 3.4	49.82 .02	34.5 0.1
15.4	34.18 .06	55.6 0.3	46.74 .15	66.8 2.3	17.32 .07	58.9 1.3	87.06 1.40	49.7 3.1	49.79 .04	34.3 0.3
25.4	34.12 .08	55.2 0.4	46.56 .20	68.9 1.9	17.24 .10	60.0 0.9	85.46 1.79	52.7 2.7	49.73 .06	33.9 0.4
Dec. 5.3	34.03 .09	54.7 0.5	46.34 .24	70.5 1.4	17.13 .12	60.8 0.6	83.49 2.14	55.2 2.3	49.66 .08	33.4 0.5
15.3	33.94 .10	54.1 0.6	46.08 .28	71.7 0.9	17.00 .14	61.2 0.2	81.20 2.43	57.2 1.7	49.56 .10	32.9 0.6
25.3	33.83 .11	53.5 0.7	45.78 .31	72.3 0.4	16.85 .16	61.2 0.2	78.66 2.64	58.6 1.1	49.46 .11	32.2 0.7
35.3	33.71 .12	52.7 0.7	45.46 .33	72.5 0.1	16.68 .17	60.8 0.5	75.95 2.78	59.4 0.5	49.34 .12	31.5 0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Andromedæ.		κ Tucanæ.		*f* Piscium.		θ^1 Ceti.		38 Cassiopeiæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	1 4	+35 5	1 12	−69 23	1 12	+ 3 5	1 19	− 8 41	1 23	+69 44
	s	″	s	″	s	″	s	″	s	″
Jan. 0.3	9.28 .15	42.1 0.3	23.54 .56	100.0 0.3	39.71 .11	22.0 0.7	2.76 .12	56.2 0.8	49.59 .48	84.2 0.7
10.2	9.13 .16	41.6 0.6	22.98 .56	99.9 0.4	39.60 .12	21.3 0.7	2.64 .12	56.9 0.7	49.10 .51	84.6 0.1
20.2	8.96 .16	40.8 0.9	22.42 .54	99.2 1.0	39.48 .12	20.6 0.7	2.51 .13	57.5 0.5	48.59 .52	84.5 0.5
30.2	8.80 .16	39.7 1.2	21.89 .51	98.0 1.6	39.36 .12	20.0 0.6	2.38 .13	57.9 0.3	48.07 .51	83.7 1.0
Feb. 9.2	8.65 .15	38.4 1.5	21.40 .47	96.1 2.1	39.24 .11	19.5 0.5	2.26 .12	58.1 0.1	47.58 .48	82.4 1.5
19.1	8.51 .12	36.9 1.6	20.95 .42	93.8 2.5	39.13 .10	19.0 0.4	2.15 .11	58.1 0.1	47.13 .42	80.7 2.0
Mar. 1.1	8.40 .09	35.2 1.7	20.57 .35	91.1 2.9	39.04 .08	18.7 0.2	2.05 .09	57.9 0.3	46.74 .34	78.4 2.4
11.1	8.32 .06	33.5 1.7	20.26 .26	88.0 3.2	38.98 .05	18.6 0.0	1.98 .06	57.4 0.6	46.44 .25	75.9 2.6
21.1	8.29 .01	31.9 1.6	20.04 .18	84.6 3.5	38.95 .01	18.6 0.2	1.93 .03	56.7 0.8	46.24 .14	73.2 2.8
31.0	8.30 .04	30.3 1.5	19.91 .09	81.1 3.6	38.95 .02	18.9 0.4	1.93 .01	55.8 1.1	46.16 .02	70.4 2.8
Apr. 10.0	8.36 .09	28.9 1.3	19.87 .01	77.4 3.7	38.99 .06	19.4 0.6	1.96 .05	54.6 1.3	46.20 .10	67.5 2.8
20.0	8.48 .14	27.8 1.0	19.94 .12	73.6 3.7	39.08 .11	20.1 0.9	2.04 .10	53.2 1.5	46.36 .22	64.8 2.6
29.9	8.65 .19	27.0 0.7	20.11 .22	70.0 3.6	39.21 .15	21.1 1.1	2.16 .14	51.5 1.7	46.63 .33	62.4 2.3
May 9.9	8.86 .24	26.5 0.3	20.37 .31	66.4 3.5	39.38 .19	22.3 1.3	2.32 .18	49.7 1.9	47.02 .44	60.2 2.0
19.9	9.13 .28	26.3 0.1	20.73 .40	63.0 3.3	39.59 .23	23.7 1.5	2.52 .22	47.7 2.0	47.51 .54	58.4 1.6
29.9	9.43 .32	26.6 0.4	21.17 .48	59.9 3.0	39.84 .26	25.3 1.7	2.75 .25	45.7 2.1	48.09 .61	57.1 1.1
June 8.8	9.76 .34	27.2 0.8	21.69 .55	57.1 2.6	40.11 .28	27.1 1.8	3.02 .28	43.6 2.1	48.74 .67	56.2 0.6
18.8	10.11 .36	28.2 1.2	22.27 .61	54.8 2.1	40.40 .30	29.0 1.9	3.30 .30	41.4 2.1	49.44 .72	55.9 0.1
28.8	10.47 .36	29.5 1.5	22.90 .64	52.9 1.6	40.70 .31	30.9 1.9	3.61 .31	39.3 2.0	50.17 .74	56.0 0.4
July 8.8	10.84 .36	31.2 1.8	23.56 .66	51.5 1.1	41.01 .31	32.8 1.9	3.91 .31	37.4 1.9	50.91 .74	56.7 0.9
18.7	11.20 .35	33.0 2.0	24.22 .66	50.7 0.5	41.32 .30	34.7 1.8	4.22 .30	35.6 1.7	51.65 .73	57.9 1.4
28.7	11.54 .33	35.1 2.2	24.88 .64	50.5 0.1	41.62 .29	36.5 1.7	4.52 .29	33.9 1.5	52.37 .70	59.5 1.8
Aug. 7.7	11.86 .31	37.4 2.3	25.51 .61	50.9 0.7	41.90 .27	38.2 1.6	4.80 .28	32.6 1.2	53.05 .66	61.5 2.2
17.6	12.16 .28	39.7 2.4	26.10 .55	51.8 1.2	42.16 .24	39.6 1.4	5.07 .25	31.5 0.9	53.68 .61	63.9 2.6
27.6	12.42 .24	42.1 2.4	26.61 .48	53.3 1.7	42.39 .21	40.9 1.1	5.30 .22	30.7 0.6	54.25 .54	66.7 2.9
Sept. 6.6	12.64 .20	44.5 2.4	27.05 .39	55.3 2.2	42.59 .18	41.9 0.9	5.50 .19	30.3 0.3	54.75 .46	69.7 3.1
16.6	12.83 .17	46.8 2.3	27.40 .29	57.7 2.6	42.75 .15	42.7 0.6	5.67 .16	30.1 0.0	55.18 .38	72.9 3.3
26.5	12.97 .13	49.1 2.2	27.64 .19	60.5 2.9	42.88 .12	43.2 0.4	5.81 .12	30.3 0.3	55.52 .30	76.2 3.4
Oct. 6.5	13.08 .09	51.2 2.0	27.77 .08	63.5 3.1	42.98 .08	43.5 0.2	5.91 .08	30.7 0.6	55.77 .21	79.6 3.4
16.5	13.15 .05	53.1 1.9	27.79 .03	66.6 3.1	43.04 .05	43.5 0.0	5.98 .05	31.4 0.8	55.94 .12	83.0 3.4
26.5	13.18 .01	54.9 1.7	27.70 .14	69.7 3.1	43.08 .02	43.3 0.2	6.01 .02	32.3 0.9	56.01 .02	86.4 3.3
Nov. 5.4	13.18 .02	56.4 1.4	27.51 .24	72.7 2.9	43.08 .01	43.0 0.4	6.01 .01	33.3 1.0	55.99 .07	89.6 3.1
15.4	13.14 .05	57.7 1.1	27.22 .33	75.5 2.6	43.06 .03	42.6 0.5	5.99 .03	34.4 1.1	55.87 .16	92.5 2.8
25.4	13.07 .08	58.7 0.8	26.84 .41	77.9 2.2	43.02 .06	42.0 0.6	5.95 .06	35.5 1.1	55.67 .24	95.2 2.5
Dec. 5.3	12.98 .10	59.4 0.5	26.40 .47	79.9 1.7	42.95 .08	41.3 0.7	5.88 .08	36.6 1.1	55.39 .32	97.4 2.1
15.3	12.86 .12	59.8 0.2	25.90 .52	81.4 1.2	42.87 .09	40.6 0.7	5.79 .10	37.7 1.0	55.03 .39	99.3 1.6
25.3	12.73 .14	59.8 0.1	25.36 .55	82.3 0.6	42.77 .11	39.9 0.7	5.68 .11	38.7 0.9	54.60 .45	100.6 1.0
35.3	12.58 .16	59.5 0.5	24.80 .56	82.6 0.0	42.65 .12	39.1 0.7	5.57 .12	39.5 0.8	54.13 .50	101.3 0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Piscium.		ν Andromedæ.		π Piscium.		α Eridani. (*Achernar.*)		ν Piscium.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 1 26	° ′ +14 49	h m 1 30	° ′ +40 54	h m 1 31	° ′ +11 37	h m 1 33	° ′ −57 44	h m 1 36	° ′ + 4 58
	s	″	s	″	s	″	s	″	s	″
Jan. 0.3	9.30 .12	58.8 0.6	57.28 .16	36.7 0.0	49.23 .11	56.4 0.6	60.61 .33	53.3 0.7	15.04 .11	59.8 0.7
10.3	9.18 .12	58.1 0.7	57.11 .18	36.6 0.4	49.11 .12	55.8 0.7	60.27 .34	53.7 0.2	14.93 .12	59.1 0.7
20.2	9.05 .13	57.4 0.7	56.92 .19	36.0 0.7	48.98 .13	55.1 0.7	59.93 .34	53.6 0.4	14.80 .13	58.4 0.7
30.2	8.92 .13	56.6 0.8	56.73 .19	35.1 1.0	48.85 .13	54.3 0.7	59.60 .33	52.9 0.9	14.67 .13	57.7 0.6
Feb. 9.2	8.79 .12	55.8 0.8	56.54 .18	33.9 1.3	48.72 .13	53.6 0.7	59.27 .31	51.7 1.5	14.55 .12	57.1 0.6
19.2	8.67 .11	55.0 0.8	56.37 .16	32.5 1.6	48.60 .13	52.9 0.7	58.97 .28	50.0 2.0	14.43 .11	56.6 0.5
Mar. 1.1	8.57 .09	54.2 0.8	56.22 .13	30.8 1.7	48.50 .09	52.2 0.6	58.71 .24	47.8 2.4	14.32 .09	56.2 0.3
11.1	8.49 .06	53.5 0.7	56.10 .10	29.0 1.8	48.42 .07	51.6 0.5	58.49 .20	45.2 2.8	14.24 .07	56.0 0.1
21.1	8.45 .03	52.9 0.5	56.03 .05	27.1 1.8	48.37 .03	51.2 0.3	58.32 .14	42.3 3.1	14.18 .04	56.0 0.0
31.0	8.44 .01	52.4 0.3	56.00 .00	25.3 1.8	48.35 .01	51.0 0.1	58.21 .08	39.1 3.3	14.16 .00	56.1 0.2
Apr. 10.0	8.47 .06	52.2 0.1	56.03 .06	23.6 1.6	48.38 .05	50.9 0.1	58.17 .01	35.7 3.4	14.19 .04	56.4 0.3
20.0	8.55 .10	52.2 0.1	56.12 .12	22.1 1.4	48.45 .09	51.1 0.3	58.19 .06	32.2 3.5	14.25 .09	57.0 0.7
30.0	8.68 .15	52.5 0.4	56.27 .17	20.9 1.1	48.57 .14	51.5 0.6	58.29 .13	28.7 3.6	14.36 .13	57.8 0.9
May 9.9	8.84 .19	53.0 0.7	56.47 .23	19.9 0.8	48.73 .18	52.2 0.8	58.45 .20	25.1 3.5	14.51 .17	58.9 1.1
19.9	9.05 .23	53.8 0.9	56.72 .28	19.3 0.4	48.93 .22	53.2 1.0	58.68 .26	21.7 3.3	14.70 .21	60.2 1.4
29.9	9.30 .26	54.8 1.2	57.02 .32	19.1 0.0	49.17 .25	54.4 1.3	58.98 .32	18.5 3.1	14.93 .24	61.7 1.6
June 8.9	9.57 .29	56.1 1.4	57.36 .35	19.3 0.4	49.44 .28	55.8 1.5	59.33 .37	15.5 2.8	15.19 .27	63.3 1.7
18.8	9.87 .31	57.6 1.6	57.72 .37	19.8 0.7	49.73 .30	57.3 1.6	59.73 .41	12.8 2.5	15.47 .29	65.1 1.8
28.8	10.18 .32	59.3 1.7	58.10 .39	20.7 1.1	50.04 .31	59.0 1.7	60.16 .44	10.6 2.0	15.77 .30	66.9 1.9
July 8.8	10.50 .32	61.1 1.8	58.49 .39	22.0 1.4	50.35 .31	60.8 1.8	60.62 .46	8.8 1.5	16.08 .31	68.8 1.9
18.7	10.82 .32	62.9 1.9	58.88 .38	23.6 1.7	50.66 .31	62.7 1.8	61.09 .47	7.5 1.0	16.39 .31	70.6 1.8
28.7	11.13 .30	64.8 1.9	59.25 .37	25.4 1.9	50.97 .30	64.5 1.8	61.55 .46	6.8 0.5	16.69 .30	72.4 1.7
Aug. 7.7	11.43 .28	66.6 1.8	59.61 .35	27.4 2.1	51.27 .28	66.3 1.7	62.01 .44	6.6 0.1	16.98 .28	74.0 1.6
17.7	11.70 .26	68.4 1.7	59.95 .32	29.6 2.3	51.54 .26	68.0 1.6	62.43 .41	7.0 0.7	17.25 .26	75.5 1.4
27.6	11.94 .23	70.0 1.6	60.25 .29	32.0 2.4	51.78 .23	69.5 1.4	62.82 .36	8.0 1.2	17.49 .23	76.8 1.2
Sept. 6.6	12.16 .20	71.5 1.4	60.52 .25	34.4 2.4	52.00 .20	70.8 1.3	63.15 .31	9.5 1.7	17.71 .20	77.9 1.0
16.6	12.34 .17	72.9 1.3	60.74 .21	36.8 2.4	52.18 .17	72.0 1.1	63.43 .25	11.4 2.1	17.90 .17	78.7 0.7
26.6	12.49 .13	74.0 1.1	60.93 .17	39.2 2.4	52.34 .14	73.0 0.9	63.64 .18	13.8 2.5	18.05 .14	79.3 0.5
Oct. 6.5	12.61 .10	75.0 0.9	61.08 .13	41.5 2.3	52.46 .10	73.8 0.7	63.79 .11	16.5 2.8	18.17 .11	79.7 0.2
16.5	12.69 .07	75.7 0.7	61.19 .09	43.7 2.1	52.55 .07	74.3 0.5	63.86 .04	19.4 3.0	18.26 .07	79.8 0.0
26.5	12.74 .04	76.3 0.5	61.26 .05	45.8 2.0	52.60 .04	74.6 0.3	63.86 .03	22.4 3.0	18.32 .04	79.7 0.2
Nov. 5.4	12.77 .01	76.7 0.3	61.29 .01	47.7 1.8	52.63 .01	74.8 0.1	63.80 .10	25.4 2.9	18.35 .01	79.5 0.3
15.4	12.76 .02	76.8 0.1	61.28 .03	49.3 1.5	52.63 .01	74.8 0.1	63.67 .16	28.2 2.7	18.35 .01	79.1 0.5
25.4	12.73 .04	76.8 0.1	61.23 .06	50.7 1.2	52.60 .04	74.6 0.2	63.49 .21	30.8 2.4	18.33 .03	78.6 0.6
Dec. 5.4	12.67 .07	76.7 0.2	61.15 .10	51.8 0.9	52.55 .06	74.3 0.4	63.26 .25	33.1 2.0	18.28 .06	78.0 0.6
15.3	12.60 .09	76.4 0.4	61.04 .13	52.5 0.6	52.48 .08	73.9 0.5	62.98 .29	34.9 1.6	18.21 .08	77.3 0.7
25.3	12.50 .11	75.9 0.5	60.90 .15	52.9 0.2	52.38 .10	73.4 0.6	62.67 .32	36.3 1.1	18.12 .10	76.6 0.7
35.3	12.39 .12	75.4 0.6	60.74 .17	53.0 0.1	52.27 .12	72.8 0.7	62.35 .34	37.1 0.6	18.01 .11	75.9 0.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.		*o* Piscium.		ζ Ceti.		β Arietis.		50 Cassiopeiæ.		γ Andromedæ.	
		Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
		h m 1 40	° ′ + 8 39	h m 1 46	° ′ −10 49	h m 1 49	° ′ +20 19	h m 1 54	° ′ +71 56	h m 1 57	° ′ +41 50
		s	″	s	″	s	″	s	″	s	″
Jan.	0.3	8.22 .11	23.1 0.7	32.88 .11	44.1 0.9	8.48 .11	19.9 0.4	56.80 .50	37.8 1.1	47.51 .15	76.6 0.3
	10.3	8.10 .12	22.5 0.7	32.76 .12	45.0 0.7	8.36 .13	19.5 0.5	56.27 .55	38.6 0.6	47.35 .17	76.7 0.1
	20.3	7.98 .13	21.8 0.7	32.63 .13	45.7 0.5	8.23 .14	18.9 0.7	55.69 .58	38.9 0.0	47.16 .19	76.4 0.5
	30.2	7.85 .13	21.1 0.7	32.49 .14	46.1 0.3	8.09 .14	18.1 0.8	55.10 .59	38.6 0.6	46.96 .20	75.8 0.8
Feb.	9.2	7.72 .13	20.4 0.6	32.35 .14	46.3 0.1	7.94 .14	17.3 0.9	54.51 .57	37.7 1.2	46.76 .20	74.8 1.1
	19.2	7.59 .12	19.8 0.6	32.22 .13	46.3 0.1	7.80 .13	16.4 0.9	53.96 .53	36.3 1.7	46.57 .18	73.6 1.4
Mar.	1.1	7.48 .10	19.3 0.5	32.10 .11	46.0 0.4	7.68 .11	15.4 0.9	53.46 .46	34.4 2.1	46.39 .16	72.1 1.6
	11.1	7.40 .07	18.9 0.3	32.01 .08	45.5 0.6	7.58 .09	14.5 0.9	53.05 .36	32.1 2.4	46.25 .13	70.4 1.7
	21.1	7.34 .04	18.6 0.2	31.94 .05	44.7 0.9	7.51 .05	13.7 0.8	52.74 .25	29.6 2.7	46.14 .08	68.7 1.8
	31.1	7.32 .00	18.5 0.0	31.90 .02	43.7 1.1	7.48 .01	12.9 0.7	52.55 .12	26.8 2.8	46.09 .03	66.9 1.8
Apr.	10.0	7.34 .04	18.7 0.2	31.91 .02	42.4 1.4	7.49 .03	12.3 0.5	52.49 .01	24.0 2.8	46.09 .03	65.2 1.7
	20.0	7.40 .08	19.0 0.5	31.95 .07	41.0 1.6	7.55 .08	12.0 0.2	52.57 .15	21.2 2.7	46.14 .09	63.6 1.5
	30.0	7.50 .13	19.6 0.7	32.04 .11	39.3 1.8	7.65 .13	11.9 0.0	52.78 .28	18.5 2.6	46.26 .15	62.2 1.2
May	9.9	7.65 .17	20.4 1.0	32.18 .15	37.4 2.0	7.81 .18	12.0 0.3	53.13 .41	16.1 2.3	46.43 .20	61.1 0.9
	19.9	7.85 .21	21.5 1.2	32.35 .19	35.3 2.1	8.00 .22	12.4 0.5	53.59 .52	14.0 1.9	46.66 .25	60.3 0.6
	29.9	8.08 .24	22.8 1.4	32.57 .23	33.2 2.2	8.24 .25	13.1 0.8	54.17 .62	12.2 1.5	46.94 .30	59.8 0.3
June	8.9	8.34 .27	24.3 1.6	32.81 .26	31.0 2.2	8.51 .28	14.1 1.1	54.83 .70	10.9 1.1	47.26 .34	59.7 0.1
	18.8	8.62 .29	25.9 1.7	33.09 .28	28.8 2.2	8.81 .30	15.2 1.3	55.56 .76	10.1 0.6	47.61 .36	60.0 0.4
	28.8	8.92 .31	27.7 1.8	33.38 .30	26.6 2.1	9.12 .32	16.6 1.5	56.35 .80	9.8 0.1	47.99 .38	60.6 0.8
July	8.8	9.24 .31	29.5 1.8	33.68 .31	24.6 1.9	9.45 .33	18.2 1.6	57.16 .82	10.0 0.4	48.38 .39	61.6 1.1
	18.8	9.55 .31	31.3 1.8	33.99 .31	22.8 1.7	9.78 .33	19.8 1.7	57.99 .83	10.7 0.9	48.78 .39	62.9 1.4
	28.7	9.85 .30	33.1 1.7	34.30 .30	21.1 1.5	10.10 .32	21.6 1.8	58.81 .81	11.8 1.4	49.17 .38	64.4 1.7
Aug.	7.7	10.15 .28	34.8 1.6	34.59 .28	19.7 1.2	10.41 .30	23.4 1.8	59.60 .78	13.4 1.8	49.54 .36	66.2 1.9
	17.7	10.42 .26	36.4 1.5	34.86 .26	18.7 0.9	10.70 .28	25.2 1.8	60.36 .73	15.5 2.2	49.90 .34	68.2 2.1
	27.7	10.67 .24	37.8 1.3	35.12 .24	18.0 0.6	10.96 .25	26.9 1.7	61.06 .67	17.8 2.5	50.23 .31	70.4 2.2
Sept.	6.6	10.89 .21	39.0 1.1	35.34 .21	17.6 0.2	11.20 .22	28.5 1.6	61.69 .60	20.5 2.8	50.53 .28	72.6 2.3
	16.6	11.08 .18	40.0 0.9	35.54 .18	17.5 0.1	11.41 .19	30.1 1.5	62.25 .52	23.5 3.1	50.79 .25	74.9 2.3
	26.6	11.24 .14	40.8 0.7	35.70 .15	17.8 0.4	11.59 .16	31.4 1.3	62.73 .43	26.7 3.2	51.02 .21	77.2 2.3
Oct.	6.5	11.37 .11	41.4 0.5	35.82 .11	18.3 0.7	11.74 .13	32.6 1.1	63.11 .33	30.0 3.3	51.20 .17	79.4 2.2
	16.5	11.47 .08	41.7 0.3	35.92 .08	19.2 0.9	11.85 .10	33.7 0.9	63.39 .23	33.3 3.4	51.35 .13	81.6 2.1
	26.5	11.53 .05	41.9 0.1	35.98 .05	20.2 1.1	11.93 .06	34.5 0.7	63.57 .13	36.7 3.3	51.46 .09	83.7 2.0
Nov.	5.5	11.57 .02	41.9 0.1	36.01 .02	21.4 1.2	11.97 .03	35.2 0.6	63.65 .02	40.0 3.2	51.53 .05	85.6 1.8
	15.4	11.57 .01	41.7 0.3	36.01 .01	22.7 1.3	11.99 .00	35.7 0.4	63.62 .08	43.1 3.0	51.55 .01	87.4 1.6
	25.4	11.55 .03	41.3 0.4	35.98 .04	24.0 1.3	11.98 .02	36.0 0.2	63.48 .19	46.0 2.7	51.54 .03	88.9 1.4
Dec.	5.4	11.51 .06	40.9 0.5	35.93 .06	25.3 1.3	11.94 .05	36.1 0.0	63.23 .29	48.6 2.4	51.49 .07	90.1 1.1
	15.3	11.44 .08	40.4 0.6	35.86 .08	26.5 1.2	11.88 .08	36.1 0.1	62.89 .39	50.7 2.0	51.40 .10	91.1 0.8
	25.3	11.35 .10	39.8 0.6	35.76 .10	27.6 1.1	11.79 .10	35.8 0.3	62.47 .47	52.4 1.5	51.28 .14	91.7 0.5
	35.3	11.24 .12	39.1 0.7	35.65 .12	28.6 0.9	11.68 .12	35.5 0.4	61.97 .53	53.6 0.9	51.13 .17	92.0 0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Arietis.		β Trianguli.		ξ¹ Ceti.		γ Trianguli.		67 Ceti.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 2 1	° ′ +22 59	h m 2 3	° ′ +34 30	h m 2 7	° ′ + 8 22	h m 2 11	° ′ +33 23	h m 2 12	° ′ − 6 52
	s	″	s	″	s	″	s	″	s	″
Jan. 0.3	33.81 .11	33.8 0.3	37.38 .12	66.1 0.1	43.57 .10	45.6 0.6	23.99 .12	19.0 0.1	1.27 .10	57.6 1.0
10.3	33.69 .13	33.5 0.4	37.24 .15	66.1 0.2	43.46 .12	44.9 0.6	23.86 .14	18.9 0.2	1.16 .12	58.5 0.8
20.3	33.56 .14	33.0 0.6	37.08 .17	65.7 0.5	43.34 .13	44.3 0.6	23.71 .16	18.6 0.5	1.03 .13	59.3 0.7
30.2	33.41 .15	32.3 0.8	36.91 .18	65.1 0.8	43.20 .14	43.6 0.6	23.54 .17	18.0 0.7	0.90 .14	59.9 0.5
Feb. 9.2	33.26 .15	31.4 0.9	36.74 .17	64.2 1.0	43.06 .14	43.0 0.6	23.36 .17	17.2 0.9	0.75 .14	60.2 0.3
19.2	33.11 .14	30.5 0.9	36.56 .17	63.1 1.2	42.93 .13	42.4 0.5	23.19 .16	16.1 1.1	0.61 .14	60.4 0.1
Mar. 1.2	32.98 .12	29.6 1.0	36.41 .15	61.8 1.3	42.80 .12	41.9 0.4	23.03 .15	14.9 1.3	0.48 .12	60.4 0.2
11.1	32.87 .09	28.6 1.0	36.28 .11	60.4 1.4	42.69 .10	41.6 0.3	22.90 .12	13.6 1.4	0.37 .10	60.1 0.4
21.1	32.79 .06	27.6 0.9	36.18 .07	58.9 1.4	42.61 .07	41.3 0.2	22.79 .08	12.2 1.4	0.28 .07	59.6 0.6
31.1	32.74 .02	26.7 0.8	36.13 .03	57.5 1.4	42.56 .03	41.3 0.0	22.73 .04	10.9 1.3	0.22 .04	58.8 0.9
Apr. 10.0	32.74 .02	26.0 0.6	36.12 .02	56.2 1.3	42.55 .01	41.4 0.2	22.72 .01	9.6 1.2	0.20 .00	57.8 1.1
20.0	32.79 .07	25.5 0.4	36.17 .07	55.0 1.1	42.59 .06	41.7 0.4	22.76 .06	8.5 1.0	0.22 .04	56.6 1.3
30.0	32.88 .12	25.2 0.2	36.27 .13	54.0 0.9	42.67 .10	42.2 0.7	22.85 .12	7.5 0.8	0.29 .09	55.2 1.5
May 10.0	33.02 .17	25.1 0.1	36.43 .18	53.3 0.6	42.79 .15	43.0 0.9	22.99 .17	6.8 0.6	0.40 .14	53.6 1.7
19.9	33.21 .21	25.3 0.3	36.63 .23	52.8 0.3	42.96 .19	44.0 1.1	23.19 .22	6.4 0.3	0.56 .18	51.7 1.9
29.9	33.45 .25	25.8 0.6	36.88 .27	52.7 0.0	43.17 .23	45.3 1.3	23.43 .26	6.3 0.0	0.75 .21	49.8 2.0
June 8.9	33.71 .28	26.5 0.9	37.18 .31	52.9 0.4	43.41 .26	46.6 1.5	23.72 .30	6.5 0.3	0.98 .24	47.8 2.1
18.9	34.01 .31	27.5 1.1	37.50 .34	53.4 0.7	43.68 .28	48.2 1.6	24.03 .33	7.0 0.6	1.24 .27	45.7 2.1
28.8	34.32 .32	28.8 1.3	37.84 .35	54.2 1.0	43.97 .30	49.9 1.7	24.37 .35	7.8 0.9	1.52 .29	43.6 2.0
July 8.8	34.65 .33	30.2 1.5	38.20 .36	55.4 1.3	44.28 .31	51.6 1.7	24.72 .36	8.9 1.2	1.82 .30	41.6 1.9
18.8	34.98 .33	31.7 1.6	38.56 .36	56.7 1.5	44.59 .31	53.3 1.7	25.08 .36	10.2 1.4	2.13 .30	39.8 1.8
28.7	35.31 .32	33.4 1.7	38.93 .36	58.3 1.7	44.89 .30	55.0 1.7	25.44 .35	11.7 1.6	2.43 .30	38.1 1.6
Aug. 7.7	35.63 .31	35.2 1.8	39.27 .34	60.0 1.8	45.19 .29	56.6 1.6	25.79 .34	13.4 1.7	2.72 .29	36.6 1.3
17.7	35.93 .29	36.9 1.7	39.61 .32	61.9 1.9	45.48 .28	58.1 1.4	26.12 .32	15.2 1.8	3.01 .27	35.4 1.0
27.7	36.21 .27	38.6 1.7	39.91 .29	63.9 2.0	45.74 .25	59.5 1.2	26.43 .30	17.1 1.9	3.27 .25	34.5 0.7
Sept. 6.6	36.46 .24	40.3 1.6	40.19 .26	65.9 2.0	45.99 .23	60.6 1.0	26.71 .27	19.0 1.9	3.51 .23	34.0 0.4
16.6	36.69 .21	41.9 1.5	40.44 .23	67.9 2.0	46.20 .20	61.5 0.8	26.96 .24	20.9 1.9	3.72 .20	33.7 0.1
26.6	36.88 .18	43.3 1.4	40.66 .20	69.9 1.9	46.38 .17	62.3 0.6	27.18 .20	22.8 1.8	3.90 .17	33.8 0.2
Oct. 6.6	37.04 .15	44.6 1.2	40.84 .16	71.7 1.8	46.54 .14	62.8 0.4	27.37 .17	24.6 1.7	4.06 .14	34.1 0.5
16.5	37.17 .11	45.8 1.1	40.98 .13	73.5 1.7	46.66 .11	63.0 0.2	27.52 .13	26.3 1.6	4.18 .10	34.8 0.7
26.5	37.26 .08	46.8 0.9	41.09 .09	75.2 1.6	46.75 .08	63.1 0.0	27.63 .10	27.9 1.5	4.27 .07	35.6 0.9
Nov. 5.5	37.33 .05	47.6 0.7	41.16 .05	76.7 1.4	46.81 .05	63.0 0.2	27.71 .06	29.3 1.4	4.32 .04	36.7 1.1
15.4	37.36 .02	48.2 0.5	41.19 .02	78.0 1.2	46.85 .02	62.8 0.3	27.76 .03	30.6 1.2	4.35 .01	37.8 1.2
25.4	37.36 .01	48.7 0.4	41.20 .02	79.1 1.0	46.85 .01	62.4 0.4	27.77 .01	31.6 1.0	4.35 .01	39.0 1.2
Dec. 5.4	37.33 .04	49.0 0.2	41.16 .05	80.0 0.8	46.83 .04	61.9 0.5	27.74 .04	32.5 0.7	4.32 .04	40.2 1.2
15.4	37.28 .07	49.1 0.0	41.10 .08	80.7 0.5	46.78 .06	61.4 0.6	27.68 .08	33.1 0.5	4.27 .07	41.4 1.2
25.3	37.19 .10	49.0 0.2	41.00 .11	81.0 0.2	46.70 .09	60.8 0.6	27.59 .11	33.5 0.3	4.19 .09	42.5 1.1
35.3	37.08 .12	48.7 0.4	40.87 .14	81.1 0.2	46.61 .11	60.1 0.7	27.47 .14	33.6 0.0	4.09 .11	43.5 0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Hydri.		ι Cassiopeiæ.		ξ² Ceti.		μ Hydri.		δ Ceti.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 2 19	° ′ −69 6	h m 2 20	° ′ +66 57	h m 2 22	° ′ + 8 0	h m 2 33	° ′ −79 32	h m 2 34	° ′ − 0 5
	s	″	s	″	s	″	s	″	s	″
Jan. 0.3	59.77 .54	65.1 1.2	52.79 .32	31.3 1.3	52.20 .09	48.5 0.7	49.59 1.14	58.6 1.2	23.11 .09	67.2 0.9
10.3	59.21 .57	66.0 0.6	52.43 .40	32.3 0.8	52.09 .11	47.8 0.6	48.41 1.21	59.5 0.6	23.01 .11	68.0 0.8
20.3	58.63 .59	66.3 0.0	52.01 .44	32.8 0.2	51.97 .13	47.2 0.6	47.16 1.25	59.8 0.0	22.89 .13	68.8 0.7
30.2	58.04 .59	66.1 0.6	51.56 .46	32.7 0.3	51.84 .14	46.6 0.6	45.89 1.27	59.5 0.6	22.75 .14	69.4 0.6
Feb. 9.2	57.45 .58	65.2 1.2	51.10 .45	32.1 0.9	51.69 .14	46.0 0.6	44.63 1.24	58.6 1.2	22.61 .15	69.9 0.5
19.2	56.89 .55	63.7 1.7	50.66 .43	31.0 1.4	51.55 .14	45.4 0.5	43.42 1.19	57.2 1.7	22.46 .14	70.3 0.3
Mar. 1.2	56.36 .50	61.8 2.2	50.24 .39	29.4 1.8	51.42 .13	45.0 0.4	42.27 1.10	55.2 2.2	22.32 .13	70.5 0.1
11.1	55.89 .44	59.4 2.6	49.88 .32	27.4 2.2	51.30 .11	44.6 0.3	41.23 .98	52.8 2.6	22.19 .11	70.5 0.1
21.1	55.49 .37	56.6 3.0	49.60 .24	25.1 2.4	51.20 .08	44.4 0.1	40.31 .84	50.0 3.0	22.09 .09	70.4 0.3
31.1	55.16 .28	53.4 3.3	49.41 .15	22.6 2.6	51.14 .04	44.3 0.0	39.55 .68	46.9 3.3	22.02 .06	70.0 0.5
Apr. 10.1	54.93 .19	50.0 3.5	49.31 .04	19.9 2.7	51.12 .00	44.5 0.2	38.95 .51	43.5 3.5	21.98 .02	69.5 0.7
20.0	54.79 .09	46.5 3.6	49.32 .07	17.3 2.6	51.14 .04	44.8 0.4	38.53 .33	39.9 3.6	21.98 .03	68.7 0.9
30.0	54.75 .02	42.8 3.7	49.44 .18	14.8 2.5	51.20 .09	45.3 0.6	38.30 .13	36.3 3.7	22.03 .07	67.7 1.1
May 10.0	54.82 .12	39.1 3.7	49.67 .28	12.4 2.2	51.31 .13	46.1 0.9	38.27 .07	32.6 3.6	22.13 .12	66.4 1.3
19.9	54.99 .22	35.5 3.6	50.00 .38	10.3 1.9	51.47 .17	47.1 1.1	38.44 .26	29.0 3.5	22.26 .16	65.0 1.5
29.9	55.26 .32	32.0 3.4	50.43 .47	8.5 1.6	51.66 .21	48.3 1.3	38.80 .45	25.6 3.3	22.44 .20	63.5 1.6
June 8.9	55.63 .41	28.8 3.1	50.93 .54	7.1 1.2	51.89 .25	49.7 1.4	39.34 .63	22.3 3.1	22.66 .23	61.8 1.7
18.9	56.07 .49	25.8 2.8	51.51 .60	6.2 0.7	52.16 .27	51.2 1.6	40.06 .79	19.4 2.8	22.91 .26	59.9 1.8
28.8	56.59 .55	23.3 2.3	52.13 .64	5.7 0.3	52.44 .29	52.8 1.6	40.92 .93	16.9 2.3	23.18 .28	58.1 1.8
July 8.8	57.17 .60	21.2 1.8	52.78 .67	5.7 0.2	52.74 .30	54.4 1.7	41.91 1.04	14.8 1.8	23.47 .30	56.3 1.8
18.8	57.79 .63	19.6 1.3	53.46 .68	6.1 0.7	53.05 .31	56.1 1.7	43.00 1.12	13.3 1.3	23.77 .30	54.4 1.7
28.8	58.43 .64	18.5 0.7	54.14 .67	7.0 1.1	53.36 .31	57.8 1.6	44.15 1.17	12.3 0.7	24.07 .30	52.8 1.6
Aug. 7.7	59.07 .64	18.1 0.1	54.80 .66	8.3 1.5	53.66 .30	59.4 1.5	45.33 1.18	11.9 0.1	24.37 .29	51.3 1.4
17.7	59.70 .62	18.3 0.5	55.45 .63	10.0 1.9	53.95 .28	60.8 1.4	46.50 1.15	12.1 0.5	24.66 .28	50.0 1.2
27.7	60.29 .57	19.1 1.1	56.06 .59	12.1 2.2	54.22 .26	62.1 1.2	47.63 1.09	12.8 1.1	24.93 .26	48.9 1.0
Sept. 6.6	60.84 .51	20.4 1.6	56.62 .54	14.4 2.5	54.47 .24	63.2 1.0	48.67 .99	14.2 1.7	25.19 .24	48.1 0.7
16.6	61.31 .44	22.3 2.1	57.12 .48	17.1 2.8	54.70 .21	64.1 0.8	49.59 .85	16.2 2.2	25.41 .22	47.6 0.4
26.6	61.70 .35	24.7 2.6	57.57 .41	19.9 2.9	54.89 .18	64.7 0.5	50.36 .68	18.6 2.6	25.62 .19	47.3 0.1
Oct. 6.6	62.00 .25	27.4 2.9	57.95 .34	22.9 3.0	55.06 .15	65.2 0.3	50.95 .49	21.4 3.0	25.79 .16	47.3 0.2
16.5	62.19 .14	30.5 3.1	58.25 .26	26.0 3.1	55.20 .12	65.4 0.1	51.34 .28	24.5 3.2	25.93 .13	47.6 0.4
26.5	62.28 .03	33.7 3.3	58.48 .18	29.1 3.1	55.31 .09	65.4 0.1	51.51 .06	27.8 3.3	26.05 .10	48.1 0.6
Nov. 5.5	62.25 .08	37.0 3.3	58.62 .10	32.2 3.0	55.38 .06	65.3 0.2	51.46 .16	31.1 3.3	26.14 .07	48.8 0.7
15.5	62.12 .18	40.3 3.1	58.68 .02	35.2 2.9	55.43 .03	65.0 0.4	51.18 .38	34.4 3.2	26.19 .04	49.6 0.8
25.4	61.89 .28	43.3 2.9	58.65 .07	37.9 2.7	55.45 .00	64.5 0.5	50.69 .59	37.4 2.9	26.21 .01	50.5 0.9
Dec. 5.4	61.57 .37	46.0 2.5	58.54 .15	40.5 2.4	55.44 .02	64.0 0.5	50.00 .78	40.2 2.6	26.21 .02	51.4 1.0
15.4	61.16 .44	48.3 2.1	58.34 .24	42.6 2.0	55.40 .05	63.4 0.6	49.14 .94	42.5 2.1	26.17 .05	52.4 1.0
25.3	60.68 .50	50.1 1.6	58.07 .31	44.4 1.6	55.33 .08	62.8 0.6	48.13 1.07	44.4 1.6	26.11 .08	53.4 0.9
35.3	60.16 .55	51.4 1.0	57.73 .37	45.8 1.1	55.24 .10	62.2 0.7	47.00 1.17	45.7 1.0	26.02 .10	54.3 0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Persei.		γ Ceti.		σ Arietis.		47 Cephei.		ε Arietis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 2 37	° ′ +48 48	h m 2 38	° ′ + 2 48	h m 2 45	° ′ +14 40	h m 2 52	° ′ +79 1	h m 2 53	° ′ +20 56
	s	″	s	″	s	″	s	″	s	″
Jan. 0.3	24.57 .15	36.6 0.8	8.86 .09	55.5 0.8	60.14 .08	18.9 0.4	53.93 .71	45.0 2.0	31.57 .08	33.9 0.2
10.3	24.40 .18	37.2 0.4	8.76 .11	54.7 0.7	60.04 .11	18.4 0.5	53.15 .84	46.8 1.5	31.48 .11	33.6 0.3
20.3	24.19 .21	37.4 0.0	8.64 .13	54.0 0.7	59.92 .13	17.9 0.5	52.25 .95	48.0 0.9	31.36 .13	33.3 0.4
30.3	23.96 .24	37.3 0.4	8.51 .14	53.4 0.6	59.79 .14	17.4 0.6	51.26 1.01	48.5 0.3	31.21 .15	32.8 0.5
Feb. 9.2	23.72 .25	36.7 0.8	8.36 .15	52.8 0.5	59.64 .15	16.8 0.6	50.24 1.03	48.5 0.3	31.06 .16	32.3 0.6
19.2	23.47 .24	35.7 1.1	8.21 .15	52.4 0.4	59.48 .15	16.1 0.6	49.21 1.01	47.9 0.9	30.89 .16	31.6 0.7
Mar. 1.2	23.24 .22	34.4 1.4	8.07 .14	52.1 0.2	59.33 .14	15.5 0.6	48.24 .94	46.7 1.5	30.74 .15	30.9 0.7
11.2	23.03 .19	32.9 1.6	7.94 .12	51.9 0.1	59.20 .12	15.0 0.5	47.35 .82	45.0 2.0	30.59 .14	30.1 0.7
21.1	22.87 .14	31.1 1.8	7.84 .09	52.0 0.1	59.09 .10	14.5 0.4	46.60 .67	42.8 2.4	30.47 .11	29.4 0.7
31.1	22.75 .09	29.2 1.9	7.76 .06	52.2 0.3	59.00 .07	14.1 0.3	46.01 .49	40.3 2.6	30.38 .07	28.7 0.6
Apr. 10.1	22.69 .03	27.3 1.9	7.72 .02	52.5 0.5	58.96 .02	13.8 0.2	45.62 .29	37.6 2.8	30.33 .03	28.1 0.5
20.0	22.69 .04	25.4 1.8	7.73 .02	53.1 0.7	58.96 .02	13.7 0.0	45.43 .08	34.7 2.9	30.32 .01	27.7 0.4
30.0	22.76 .11	23.6 1.7	7.77 .07	54.0 0.9	59.00 .07	13.9 0.2	45.46 .14	31.7 2.9	30.36 .06	27.4 0.2
May 10.0	22.90 .17	22.0 1.5	7.86 .11	55.0 1.1	59.10 .12	14.2 0.4	45.71 .36	28.9 2.8	30.45 .11	27.3 0.0
20.0	23.11 .23	20.6 1.2	8.00 .16	56.2 1.3	59.24 .16	14.7 0.6	46.18 .56	26.2 2.6	30.59 .16	27.5 0.2
29.9	23.37 .29	19.5 0.9	8.18 .20	57.6 1.5	59.42 .20	15.4 0.8	46.83 .75	23.7 2.3	30.77 .20	27.8 0.5
June 8.9	23.69 .34	18.8 0.6	8.39 .23	59.2 1.6	59.64 .24	16.4 1.0	47.66 .91	21.6 1.9	30.99 .24	28.4 0.7
18.9	24.05 .38	18.4 0.2	8.64 .26	60.9 1.7	59.89 .27	17.5 1.2	48.65 1.05	19.9 1.5	31.25 .27	29.2 0.9
28.9	24.44 .41	18.3 0.2	8.91 .28	62.6 1.7	60.17 .29	18.8 1.3	49.76 1.16	18.6 1.1	31.54 .30	30.2 1.1
July 8.8	24.86 .43	18.7 0.5	9.20 .30	64.4 1.7	60.47 .30	20.2 1.4	50.97 1.25	17.8 0.6	31.84 .31	31.4 1.2
18.8	25.29 .44	19.4 0.9	9.50 .30	66.1 1.7	60.78 .31	21.6 1.5	52.24 1.30	17.5 0.1	32.16 .32	32.6 1.3
28.8	25.73 .44	20.4 1.2	9.81 .30	67.7 1.6	61.10 .31	23.1 1.5	53.55 1.32	17.7 0.4	32.49 .32	34.0 1.4
Aug. 7.7	26.16 .43	21.7 1.4	10.11 .30	69.2 1.4	61.41 .31	24.6 1.5	54.88 1.32	18.3 0.9	32.81 .32	35.4 1.4
17.7	26.58 .41	23.3 1.7	10.40 .28	70.6 1.2	61.71 .30	26.1 1.4	56.18 1.29	19.5 1.4	33.12 .31	36.8 1.4
27.7	26.98 .39	25.1 1.9	10.67 .26	71.7 1.0	62.00 .28	27.4 1.3	57.45 1.24	21.0 1.8	33.42 .29	38.2 1.4
Sept. 6.7	27.35 .36	27.1 2.1	10.93 .24	72.6 0.8	62.27 .26	28.6 1.1	58.66 1.16	23.0 2.2	33.71 .27	39.6 1.3
16.6	27.69 .32	29.2 2.2	11.16 .22	73.2 0.5	62.52 .23	29.7 1.0	59.76 1.06	25.3 2.5	33.97 .25	40.8 1.2
26.6	28.00 .28	31.4 2.3	11.36 .19	73.6 0.2	62.74 .21	30.6 0.8	60.77 .94	28.0 2.8	34.20 .22	41.9 1.1
Oct. 6.6	28.27 .24	33.7 2.3	11.54 .16	73.7 0.0	62.93 .18	31.3 0.6	61.64 .81	30.9 3.1	34.41 .19	42.9 0.9
16.6	28.49 .20	36.1 2.5	11.69 .13	73.6 0.2	63.10 .15	31.8 0.4	62.38 .66	34.1 3.2	34.59 .17	43.8 0.8
26.5	28.67 .16	38.4 2.3	11.81 .10	73.3 0.4	63.23 .12	32.2 0.3	62.96 .49	37.4 3.3	34.74 .14	44.5 0.6
Nov. 5.5	28.80 .11	40.6 2.2	11.90 .07	72.8 0.6	63.34 .09	32.4 0.1	63.36 .30	40.7 3.4	34.86 .10	45.0 0.5
15.5	28.89 .06	42.7 2.0	11.96 .04	72.1 0.7	63.41 .06	32.5 0.0	63.59 .13	44.1 3.3	34.95 .07	45.5 0.4
25.4	28.93 .01	44.6 1.8	11.99 .01	71.4 0.8	63.46 .03	32.4 0.1	63.62 .06	47.4 3.3	35.00 .04	45.8 0.2
Dec. 5.4	28.92 .04	46.3 1.6	11.99 .02	70.5 0.8	63.47 .00	32.2 0.2	63.46 .26	50.5 3.0	35.02 .00	46.0 0.1
15.4	28.86 .08	47.8 1.3	11.96 .04	69.7 0.8	63.45 .03	31.9 0.3	63.10 .45	53.3 2.7	35.01 .03	46.0 0.0
25.4	28.75 .13	49.0 1.0	11.90 .07	68.9 0.8	63.40 .06	31.6 0.4	62.57 .62	55.8 2.3	34.96 .06	46.0 0.1
35.3	28.60 .17	49.8 0.7	11.82 .10	68.0 0.8	63.32 .10	31.2 0.5	61.87 .78	57.8 1.8	34.88 .10	45.8 0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.		*a* Ceti.		*β* Persei.		48 Cephei (H.)		*ζ* Arietis.		*a* Persei.	
		Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
		h m 2 57	° ' + 3 41	h m 3 1	° ' +40 34	h m 3 7	° ' +77 21	h m 3 9	° ' +20 40	h m 3 17	° ' +49 30
		s	"	s	"	s	"	s	"	s	"
Jan.	0.4	4.95 .08	54.1 0.8	42.07 .10	26.8 0.7	44.06 .56	81.3 2.1	11.24 .07	33.5 0.2	13.75 .12	33.2 1.1
	10.3	4.86 .10	53.4 0.7	41.95 .14	27.3 0.3	43.44 .69	83.1 1.6	11.15 .10	33.3 0.3	13.61 .16	34.2 0.8
	20.3	4.74 .12	52.7 0.7	41.79 .17	27.5 0.0	42.70 .79	84.5 1.0	11.04 .13	33.0 0.4	13.42 .20	34.8 0.4
	30.3	4.61 .14	52.0 0.6	41.60 .20	27.4 0.3	41.87 .86	85.2 0.4	10.90 .15	32.5 0.5	13.20 .23	35.0 0.0
Feb.	9.2	4.46 .15	51.4 0.5	41.40 .21	27.0 0.6	40.99 .89	85.3 0.1	10.74 .16	32.0 0.5	12.96 .25	34.8 0.4
	19.2	4.31 .15	51.0 0.4	41.19 .21	26.3 0.8	40.10 .88	84.9 0.7	10.58 .17	31.4 0.6	12.70 .26	34.3 0.7
Mar.	1.2	4.16 .14	50.7 0.3	40.98 .20	25.3 1.1	39.24 .83	83.9 1.3	10.41 .16	30.8 0.6	12.44 .25	33.4 1.1
	11.2	4.02 .13	50.5 0.1	40.79 .18	24.1 1.3	38.44 .75	82.3 1.8	10.26 .15	30.1 0.7	12.20 .23	32.1 1.4
	21.1	3.90 .11	50.4 0.0	40.63 .14	22.7 1.4	37.75 .62	80.3 2.2	10.12 .12	29.4 0.7	11.99 .19	30.7 1.6
	31.1	3.81 .08	50.6 0.2	40.50 .10	21.3 1.5	37.20 .48	78.0 2.5	10.02 .08	28.8 0.6	11.82 .14	29.0 1.8
Apr.	10.1	3.76 .04	50.9 0.4	40.43 .05	19.8 1.5	36.81 .31	75.3 2.7	9.96 .04	28.2 0.5	11.71 .08	27.2 1.8
	20.1	3.74 .01	51.4 0.6	40.41 .01	18.3 1.4	36.59 .12	72.5 2.8	9.93 .00	27.8 0.4	11.65 .02	25.3 1.9
	30.0	3.77 .05	52.2 0.8	40.44 .07	16.9 1.3	36.57 .07	69.6 2.9	9.96 .05	27.5 0.2	11.67 .05	23.5 1.8
May	10.0	3.84 .10	53.1 1.0	40.54 .13	15.7 1.1	36.73 .26	66.8 2.8	10.03 .10	27.4 0.0	11.75 .12	21.8 1.7
	20.0	3.96 .14	54.2 1.2	40.69 .18	14.6 0.9	37.09 .44	64.1 2.6	10.15 .15	27.5 0.2	11.90 .18	20.2 1.5
	29.9	4.13 .18	55.5 1.4	40.90 .24	13.8 0.7	37.62 .61	61.6 2.3	10.32 .19	27.8 0.4	12.12 .24	18.8 1.2
June	8.9	4.33 .22	57.0 1.5	41.16 .28	13.3 0.4	38.30 .76	59.4 2.0	10.53 .23	28.4 0.6	12.39 .30	17.8 0.9
	18.9	4.56 .25	58.6 1.6	41.46 .32	13.1 0.1	39.13 .89	57.6 1.6	10.78 .26	29.1 0.8	12.72 .35	17.0 0.6
	28.9	4.83 .27	60.2 1.7	41.80 .35	13.2 0.2	40.08 1.00	56.2 1.2	11.05 .29	30.0 1.0	13.09 .38	16.6 0.3
July	8.8	5.11 .29	61.9 1.7	42.16 .37	13.6 0.5	41.12 1.08	55.2 0.7	11.35 .31	31.0 1.1	13.49 .41	16.4 0.0
	18.8	5.40 .30	63.6 1.6	42.54 .38	14.2 0.8	42.23 1.13	54.7 0.3	11.67 .32	32.2 1.2	13.91 .43	16.6 0.4
	28.8	5.71 .30	65.2 1.5	42.92 .39	15.2 1.0	43.38 1.16	54.7 0.2	11.99 .32	33.5 1.3	14.35 .44	17.2 0.7
Aug.	7.8	6.01 .30	66.7 1.4	43.31 .38	16.3 1.2	44.55 1.17	55.2 0.7	12.31 .32	34.8 1.3	14.79 .44	18.0 1.0
	17.7	6.30 .29	68.0 1.2	43.69 .37	17.7 1.4	45.71 1.15	56.1 1.1	12.63 .31	36.1 1.3	15.23 .43	19.1 1.2
	27.7	6.58 .27	69.1 1.0	44.05 .35	19.2 1.6	46.85 1.12	57.5 1.6	12.93 .30	37.4 1.3	15.66 .42	20.4 1.4
Sept.	6.7	6.85 .25	70.0 0.8	44.40 .33	20.8 1.7	47.94 1.06	59.2 2.0	13.22 .28	38.6 1.2	16.06 .40	22.0 1.6
	16.6	7.09 .23	70.6 0.5	44.72 .31	22.5 1.8	48.96 .98	61.4 2.3	13.49 .26	39.8 1.1	16.44 .37	23.8 1.8
	26.6	7.31 .21	71.0 0.3	45.01 .28	24.3 1.8	49.89 .88	63.8 2.6	13.74 .23	40.8 1.0	16.80 .34	25.6 1.9
Oct.	6.6	7.51 .18	71.1 0.0	45.27 .25	26.1 1.8	50.72 .77	66.6 2.9	13.96 .21	41.7 0.8	17.12 .30	27.6 2.0
	16.6	7.68 .15	71.0 0.2	45.50 .21	27.9 1.8	51.43 .65	69.6 3.1	14.15 .18	42.5 0.7	17.40 .26	29.7 2.1
	26.5	7.81 .12	70.7 0.4	45.69 .17	29.6 1.7	52.01 .51	72.7 3.2	14.32 .15	43.1 0.6	17.64 .22	31.8 2.1
Nov.	5.5	7.92 .09	70.2 0.6	45.84 .13	31.3 1.7	52.44 .36	76.0 3.3	14.46 .12	43.6 0.5	17.84 .17	33.9 2.1
	15.5	8.00 .06	69.6 0.7	45.96 .09	33.0 1.6	52.71 .19	79.3 3.3	14.56 .09	44.0 0.3	17.99 .12	35.9 2.0
	25.5	8.05 .03	68.8 0.8	46.03 .05	34.5 1.4	52.82 .02	82.5 3.2	14.63 .05	44.3 0.2	18.09 .07	37.9 1.9
Dec.	5.4	8.07 .00	68.0 0.8	46.06 .01	35.8 1.2	52.76 .15	85.5 3.0	14.67 .02	44.4 0.1	18.14 .02	39.7 1.7
	15.4	8.06 .03	67.2 0.8	46.04 .04	36.9 1.0	52.53 .32	88.4 2.7	14.67 .02	44.5 0.0	18.13 .03	41.4 1.5
	25.4	8.01 .06	66.3 0.8	45.98 .08	37.8 0.8	52.13 .48	90.9 2.3	14.63 .05	44.4 0.1	18.07 .09	42.8 1.3
	35.3	7.94 .09	65.5 0.8	45.88 .13	38.5 0.5	51.58 .62	93.0 1.9	14.57 .08	44.3 0.2	17.95 .14	43.9 1.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Hydri.		*f* Tauri.		ε Eridani.		δ Persei.		γ Camelopardalis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 3 18	° ′ −77 44	h m 3 25	° ′ +12 35	h m 3 28	° ′ − 9 47	h m 3 35	° ′ +47 28	h m 3 39	° ′ +71 1
	s	″	s	″	s	″	s	″	s	″
Jan. 0.4	29.82 .88	86.1 1.9	23.17 .06	43.1 0.5	15.05 .07	49.1 1.4	51.11 .08	16.6 1.1	53.22 .27	42.2 2.1
10.3	28.89 .99	87.7 1.3	23.09 .09	42.6 0.5	14.96 .10	50.4 1.2	51.00 .13	17.5 0.8	52.90 .37	44.1 1.7
20.3	27.86 1.07	88.8 0.7	22.99 .11	42.1 0.5	14.85 .13	51.5 1.0	50.84 .18	18.2 0.5	52.48 .46	45.6 1.2
30.3	26.78 1.10	89.2 0.2	22.86 .14	41.6 0.5	14.71 .15	52.3 0.7	50.64 .22	18.6 0.2	51.98 .53	46.6 0.7
Feb. 9.3	25.67 1.11	89.1 0.4	22.71 .15	41.0 0.5	14.55 .16	52.9 0.5	50.41 .24	18.6 0.2	51.43 .57	47.0 0.2
19.2	24.57 1.10	88.4 1.0	22.55 .16	40.5 0.5	14.38 .17	53.3 0.2	50.16 .25	18.2 0.5	50.85 .58	46.9 0.4
Mar. 1.2	23.49 1.05	87.1 1.5	22.39 .16	40.1 0.5	14.21 .17	53.4 0.0	49.91 .25	17.5 0.9	50.27 .57	46.3 0.9
11.2	22.48 .98	85.3 2.0	22.24 .15	39.6 0.4	14.05 .16	53.2 0.3	49.67 .23	16.4 1.2	49.72 .53	45.1 1.3
21.2	21.54 .88	83.1 2.4	22.10 .13	39.3 0.3	13.90 .14	52.8 0.5	49.45 .20	15.1 1.4	49.22 .45	43.5 1.8
31.1	20.72 .76	80.5 2.8	21.99 .10	39.0 0.2	13.78 .11	52.1 0.8	49.27 .16	13.6 1.6	48.79 .38	41.5 2.2
Apr. 10.1	20.02 .63	77.5 3.1	21.91 .06	38.9 0.1	13.69 .07	51.2 1.1	49.14 .10	12.0 1.7	48.47 .27	39.2 2.4
20.1	19.47 .47	74.2 3.3	21.87 .02	38.9 0.1	13.63 .03	50.0 1.3	49.07 .04	10.3 1.7	48.26 .15	36.7 2.6
30.0	19.08 .31	70.8 3.5	21.88 .03	39.1 0.3	13.62 .01	48.6 1.5	49.06 .02	8.6 1.7	48.17 .02	34.1 2.6
May 10.0	18.85 .14	67.3 3.6	21.93 .08	39.4 0.4	13.65 .06	47.0 1.7	49.12 .09	6.9 1.6	48.22 .11	31.4 2.6
20.0	18.79 .03	63.7 3.6	22.03 .12	39.9 0.6	13.73 .10	45.2 1.9	49.24 .15	5.4 1.4	48.39 .24	28.8 2.5
30.0	18.92 .21	60.1 3.5	22.18 .17	40.7 0.8	13.86 .14	43.2 2.0	49.43 .21	4.1 1.2	48.69 .36	26.4 2.3
June 8.9	19.21 .37	56.7 3.3	22.36 .21	41.6 1.0	14.02 .18	41.2 2.1	49.67 .27	3.0 0.9	49.10 .47	24.2 2.0
18.9	19.66 .53	53.5 3.1	22.59 .24	42.6 1.1	14.22 .22	39.1 2.1	49.97 .32	2.2 0.7	49.62 .56	22.3 1.7
28.9	20.26 .67	50.6 2.7	22.84 .27	43.8 1.2	14.46 .25	37.0 2.1	50.31 .36	1.7 0.4	50.24 .65	20.8 1.4
July 8.9	21.00 .79	48.1 2.3	23.12 .29	45.1 1.3	14.72 .27	35.0 2.0	50.68 .39	1.4 0.1	50.92 .72	19.6 1.0
18.8	21.84 .89	46.0 1.8	23.41 .30	46.4 1.3	14.99 .28	33.1 1.8	51.08 .41	1.5 0.2	51.67 .77	18.9 0.6
28.8	22.78 .97	44.5 1.3	23.72 .31	47.8 1.3	15.28 .29	31.3 1.6	51.50 .42	1.9 0.5	52.45 .80	18.5 0.1
Aug. 7.8	23.77 1.01	43.5 0.7	24.02 .31	49.1 1.3	15.58 .29	29.8 1.4	51.93 .43	2.5 0.8	53.26 .82	18.6 0.3
17.7	24.79 1.02	43.1 0.1	24.33 .30	50.3 1.2	15.87 .29	28.5 1.1	52.35 .42	3.4 1.0	54.08 .82	19.1 0.7
27.7	25.80 1.00	43.3 0.5	24.63 .29	51.5 1.1	16.15 .28	27.6 0.7	52.77 .41	4.5 1.2	54.89 .80	20.1 1.1
Sept. 6.7	26.78 .95	44.1 1.1	24.91 .28	52.5 0.9	16.43 .27	27.1 0.4	53.17 .39	5.9 1.4	55.68 .78	21.4 1.5
16.7	27.69 .86	45.5 1.7	25.18 .26	53.3 0.7	16.68 .25	26.9 0.0	53.55 .37	7.4 1.6	56.44 .74	23.0 1.8
26.6	28.49 .74	47.5 2.2	25.43 .24	54.0 0.6	16.92 .23	27.1 0.4	53.91 .34	9.0 1.7	57.15 .68	25.0 2.1
Oct. 6.6	29.17 .60	50.0 2.7	25.65 .21	54.4 0.4	17.13 .20	27.6 0.7	54.24 .31	10.7 1.8	57.80 .62	27.3 2.4
16.6	29.69 .44	52.8 3.0	25.85 .19	54.7 0.2	17.32 .17	28.4 1.0	54.54 .28	12.6 1.9	58.38 .54	29.8 2.6
26.6	30.04 .26	56.0 3.3	26.02 .16	54.8 0.0	17.48 .15	29.5 1.2	54.80 .24	14.5 1.9	58.88 .46	32.6 2.8
Nov. 5.5	30.21 .07	59.4 3.4	26.17 .13	54.8 0.1	17.61 .12	30.9 1.4	55.02 .20	16.4 1.9	59.29 .36	35.4 2.9
15.5	30.18 .12	62.8 3.4	26.28 .10	54.6 0.2	17.71 .08	32.4 1.6	55.19 .15	18.2 1.9	59.60 .26	38.4 2.9
25.5	29.96 .31	66.1 3.3	26.36 .07	54.3 0.3	17.78 .05	34.0 1.6	55.32 .10	20.0 1.8	59.81 .15	41.3 2.9
Dec. 5.4	29.56 .49	69.2 3.0	26.41 .03	54.0 0.4	17.81 .02	35.6 1.6	55.39 .05	21.8 1.7	59.89 .03	44.2 2.8
15.4	28.98 .66	72.1 2.7	26.43 .00	53.6 0.4	17.81 .02	37.2 1.5	55.41 .01	23.4 1.5	59.86 .09	46.9 2.6
25.4	28.25 .80	74.5 2.2	26.40 .04	53.1 0.5	17.78 .05	38.7 1.4	55.38 .06	24.7 1.3	59.71 .21	49.4 2.3
35.4	27.38 .92	76.5 1.7	26.35 .07	52.6 0.5	17.71 .08	40.1 1.3	55.29 .11	25.9 1.0	59.44 .32	51.6 2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Tauri.		ζ Persei.		γ Hydri.		ε Persei.		γ Eridani.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 3 41	° ′ +23 47	h m 3 47	° ′ +31 35	h m 3 48	° ′ −74 32	h m 3 51	° ′ +39 43	h m 3 53	° ′ −13 47
	s	″	s	″	s	″	s	″	s	″
Jan. 0.4	34.66 .05	52.2 0.0	53.18 .05	20.3 0.4	50.22 .62	55.6 2.3	11.28 .05	25.1 0.8	23.83 .06	37.2 1.6
10.3	34.59 .08	52.1 0.1	53.12 .09	20.6 0.3	49.55 .72	57.7 1.8	11.20 .10	25.9 0.6	23.76 .09	38.7 1.4
20.3	34.49 .12	52.0 0.2	53.01 .13	20.8 0.1	48.79 .79	59.2 1.3	11.07 .14	26.4 0.4	23.65 .12	40.0 1.2
30.3	34.36 .14	51.8 0.3	52.86 .16	20.8 0.1	47.97 .85	60.2 0.7	10.91 .18	26.6 0.1	23.52 .15	41.0 0.9
Feb. 9.3	34.20 .16	51.4 0.4	52.69 .18	20.6 0.3	47.10 .88	60.6 0.1	10.72 .20	26.6 0.2	23.36 .17	41.8 0.6
19.2	34.03 .17	51.0 0.5	52.51 .19	20.2 0.5	46.22 .89	60.4 0.5	10.51 .22	26.3 0.4	23.19 .18	42.2 0.3
Mar. 1.2	33.85 .18	50.4 0.6	52.31 .19	19.7 0.6	45.33 .87	59.7 1.0	10.29 .22	25.7 0.7	23.01 .18	42.4 0.0
11.2	33.68 .17	49.8 0.6	52.12 .18	19.0 0.8	44.48 .83	58.4 1.5	10.08 .21	24.9 0.9	22.83 .17	42.2 0.3
21.2	33.52 .15	49.2 0.7	51.95 .16	18.1 0.9	43.68 .77	56.6 2.0	9.88 .18	23.9 1.1	22.67 .15	41.8 0.6
31.1	33.39 .12	48.5 0.7	51.81 .13	17.2 0.9	42.96 .68	54.4 2.4	9.72 .15	22.7 1.2	22.52 .13	41.1 0.9
Apr. 10.1	33.30 .08	47.8 0.6	51.70 .09	16.2 1.0	42.32 .58	51.7 2.8	9.59 .10	21.5 1.3	22.41 .10	40.1 1.1
20.1	33.25 .03	47.3 0.5	51.63 .04	15.3 0.9	41.80 .47	48.8 3.1	9.51 .05	20.2 1.3	22.33 .06	38.8 1.4
30.1	33.24 .02	46.8 0.4	51.62 .01	14.4 0.8	41.39 .34	45.6 3.3	9.49 .01	18.9 1.3	22.29 .01	37.3 1.6
May 10.0	33.28 .07	46.4 0.3	51.66 .06	13.6 0.7	41.12 .20	42.2 3.5	9.53 .07	17.6 1.2	22.30 .03	35.5 1.8
20.0	33.37 .12	46.3 0.1	51.75 .12	13.0 0.6	40.98 .06	38.6 3.5	9.62 .12	16.5 1.0	22.36 .08	33.6 2.0
30.0	33.51 .16	46.3 0.1	51.89 .17	12.5 0.4	40.99 .08	35.1 3.5	9.77 .18	15.6 0.9	22.45 .12	31.5 2.1
June 8.9	33.70 .20	46.5 0.3	52.09 .21	12.2 0.2	41.14 .22	31.6 3.4	9.98 .23	14.8 0.7	22.60 .16	29.3 2.2
18.9	33.93 .24	46.8 0.5	52.32 .25	12.1 0.0	41.42 .35	28.3 3.2	10.23 .27	14.3 0.4	22.78 .20	27.1 2.2
28.9	34.19 .27	47.4 0.7	52.59 .29	12.3 0.2	41.84 .47	25.2 3.0	10.52 .31	14.0 0.2	22.99 .23	24.9 2.2
July 8.9	34.47 .30	48.1 0.8	52.90 .31	12.6 0.4	42.37 .58	22.4 2.6	10.85 .34	14.0 0.1	23.24 .25	22.7 2.1
18.8	34.78 .31	49.0 0.9	53.22 .33	13.2 0.6	42.99 .67	20.0 2.2	11.20 .36	14.2 0.3	23.50 .27	20.7 1.9
28.8	35.10 .32	50.0 1.0	53.56 .34	13.9 0.8	43.70 .75	18.0 1.7	11.57 .37	14.6 0.5	23.78 .29	18.9 1.7
Aug. 7.8	35.43 .33	51.0 1.1	53.90 .35	14.7 0.9	44.48 .80	16.6 1.1	11.95 .38	15.2 0.7	24.08 .29	17.3 1.4
17.8	35.75 .32	52.1 1.1	54.25 .35	15.7 1.0	45.29 .83	15.8 0.5	12.33 .38	16.0 0.9	24.37 .29	16.1 1.1
27.7	36.07 .31	53.2 1.1	54.60 .34	16.7 1.1	46.12 .83	15.6 0.1	12.70 .37	17.0 1.1	24.66 .29	15.2 0.7
Sept. 6.7	36.38 .30	54.3 1.0	54.93 .33	17.8 1.1	46.94 .80	16.0 0.7	13.07 .36	18.1 1.2	24.95 .28	14.6 0.3
16.7	36.67 .28	55.3 1.0	55.24 .31	18.9 1.1	47.72 .75	17.0 1.3	13.42 .34	19.4 1.3	25.22 .26	14.5 0.1
26.6	36.95 .26	56.2 0.9	55.54 .29	20.0 1.1	48.43 .68	18.7 1.9	13.75 .32	20.7 1.3	25.47 .24	14.8 0.5
Oct. 6.6	37.20 .24	57.1 0.8	55.82 .26	21.1 1.1	49.06 .58	20.8 2.4	14.06 .29	22.0 1.4	25.71 .22	15.5 0.9
16.6	37.43 .22	57.9 0.7	56.07 .24	22.2 1.1	49.58 .46	23.5 2.8	14.34 .26	23.4 1.4	25.92 .20	16.5 1.2
26.6	37.63 .19	58.5 0.6	56.29 .21	23.2 1.0	49.97 .33	26.5 3.2	14.59 .23	24.8 1.4	26.10 .17	17.8 1.5
Nov. 5.5	37.81 .16	59.1 0.5	56.49 .18	24.2 1.0	50.23 .18	29.8 3.4	14.80 .20	26.2 1.4	26.25 .14	19.4 1.7
15.5	37.95 .13	59.5 0.4	56.65 .14	25.1 0.9	50.33 .03	33.2 3.5	14.98 .16	27.6 1.4	26.38 .11	21.2 1.8
25.5	38.06 .09	59.9 0.3	56.77 .10	26.0 0.8	50.28 .12	36.7 3.4	15.12 .11	28.9 1.3	26.47 .07	23.1 1.9
Dec. 5.5	38.13 .05	60.2 0.3	56.85 .06	26.8 0.7	50.08 .27	40.1 3.3	15.21 .07	30.2 1.2	26.53 .04	25.0 1.9
15.4	38.16 .01	60.5 0.2	56.89 .02	27.5 0.6	49.74 .41	43.2 3.0	15.25 .02	31.4 1.1	26.55 .00	26.9 1.8
25.4	38.15 .03	60.6 0.1	56.89 .02	28.0 0.5	49.26 .55	46.0 2.6	15.25 .03	32.4 0.9	26.53 .04	28.7 1.7
35.4	38.11 .07	60.6 0.0	56.84 .07	28.5 0.4	48.66 .66	48.4 2.1	15.19 .08	33.2 0.8	26.47 .07	30.3 1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	A¹ Tauri.		ζ Persei.		o¹ Eridani.		γ Tauri.		ε Tauri.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 3 58	° ′ +21 48	h m 4 1	° ′ +47 26	h m 4 6	° ′ − 7 5	h m 4 14	° ′ +15 23	h m 4 22	° ′ +18 57
	s	″	s	″	s	″	s	″	s	″
Jan. 0.4	49.31 .03	36.8 0.0	27.13 .06	54.2 1.3	61.13 .04	55.1 1.4	8.44 .02	13.4 0.4	49.02 .01	34.6 0.2
10.4	49.26 .07	36.7 0.1	27.04 .11	55.3 1.0	61.07 .07	56.4 1.2	8.40 .06	13.1 0.4	48.99 .05	34.4 0.2
20.4	49.17 .11	36.5 0.2	26.90 .16	56.2 0.7	60.98 .11	57.6 1.0	8.32 .10	12.7 0.4	48.92 .09	34.2 0.2
30.3	49.04 .14	36.3 0.3	26.72 .21	56.7 0.4	60.86 .14	58.5 0.8	8.21 .13	12.3 0.4	48.81 .13	33.9 0.3
Feb. 9.3	48.89 .16	36.0 0.4	26.50 .24	56.9 0.0	60.71 .16	59.3 0.6	8.07 .15	11.9 0.4	48.67 .15	33.6 0.3
19.3	48.72 .17	35.6 0.4	26.25 .25	56.8 0.3	60.54 .17	59.8 0.4	7.91 .17	11.5 0.4	48.50 .17	33.3 0.3
Mar. 1.2	48.55 .18	35.2 0.5	26.00 .26	56.4 0.6	60.37 .18	60.1 0.2	7.74 .17	11.1 0.4	48.33 .18	33.0 0.4
11.2	48.37 .17	34.7 0.5	25.75 .25	55.6 0.9	60.20 .17	60.1 0.1	7.56 .17	10.8 0.4	48.15 .18	32.6 0.4
21.2	48.21 .15	34.1 0.5	25.51 .22	54.5 1.2	60.03 .16	59.9 0.3	7.40 .15	10.4 0.3	47.98 .16	32.2 0.4
31.2	48.07 .12	33.5 0.5	25.31 .18	53.2 1.4	59.89 .13	59.4 0.6	7.26 .13	10.1 0.3	47.83 .14	31.8 0.4
Apr. 10.1	47.96 .09	33.0 0.5	25.15 .13	51.7 1.6	59.77 .10	58.7 0.8	7.14 .10	9.9 0.2	47.71 .11	31.4 0.3
20.1	47.89 .05	32.6 0.4	25.05 .07	50.1 1.6	59.69 .06	57.8 1.0	7.06 .06	9.7 0.1	47.62 .07	31.1 0.3
30.1	47.87 .00	32.2 0.3	25.01 .00	48.4 1.7	59.65 .02	56.7 1.3	7.03 .01	9.7 0.0	47.58 .02	30.9 0.2
May 10.0	47.89 .05	32.0 0.2	25.03 .06	46.8 1.6	59.65 .02	55.3 1.5	7.03 .03	9.8 0.2	47.58 .02	30.8 0.0
20.0	47.97 .10	31.9 0.0	25.12 .12	45.2 1.5	59.70 .07	53.8 1.6	7.09 .08	10.1 0.3	47.63 .07	30.9 0.1
30.0	48.09 .15	31.9 0.2	25.27 .18	43.8 1.3	59.79 .11	52.0 1.8	7.19 .12	10.5 0.5	47.72 .12	31.0 0.2
June 9.0	48.26 .19	32.2 0.3	25.48 .24	42.6 1.1	59.92 .15	50.2 1.9	7.34 .17	11.1 0.6	47.86 .16	31.3 0.4
18.9	48.47 .23	32.6 0.5	25.75 .29	41.6 0.9	60.09 .19	48.3 1.9	7.52 .20	11.8 0.8	48.04 .20	31.8 0.5
28.9	48.71 .26	33.2 0.6	26.06 .34	40.9 0.6	60.30 .22	46.4 1.9	7.74 .23	12.6 0.9	48.26 .24	32.4 0.7
July 8.9	48.98 .28	33.9 0.8	26.42 .37	40.4 0.3	60.54 .25	44.5 1.9	7.99 .26	13.5 1.0	48.51 .26	33.1 0.8
18.9	49.27 .30	34.7 0.9	26.80 .40	40.2 0.0	60.80 .27	42.6 1.8	8.27 .28	14.5 1.0	48.79 .28	33.9 0.8
28.8	49.58 .32	35.6 0.9	27.21 .41	40.3 0.2	61.07 .28	41.0 1.6	8.56 .30	15.5 1.0	49.08 .30	34.8 0.9
Aug. 7.8	49.90 .32	36.6 1.0	27.63 .42	40.6 0.5	61.36 .29	39.5 1.4	8.86 .31	16.5 1.0	49.39 .31	35.6 0.9
17.8	50.22 .32	37.6 1.0	28.05 .42	41.2 0.7	61.65 .29	38.2 1.1	9.17 .31	17.5 0.9	49.70 .31	36.5 0.9
27.8	50.54 .31	38.5 1.0	28.48 .42	42.0 0.9	61.94 .29	37.3 0.8	9.48 .30	18.4 0.8	50.01 .31	37.3 0.8
Sept. 6.7	50.85 .30	39.5 0.9	28.89 .41	43.0 1.1	62.22 .28	36.6 0.5	9.78 .30	19.2 0.7	50.32 .30	38.1 0.7
16.7	51.15 .29	40.3 0.8	29.29 .39	44.2 1.3	62.50 .27	36.3 0.1	10.07 .29	19.9 0.6	50.62 .29	38.7 0.6
26.7	51.43 .27	41.1 0.7	29.67 .37	45.6 1.4	62.76 .25	36.4 0.2	10.34 .27	20.4 0.5	50.91 .28	39.3 0.5
Oct. 6.6	51.69 .25	41.8 0.6	30.02 .34	47.1 1.5	63.00 .23	36.8 0.6	10.61 .25	20.8 0.3	51.18 .26	39.7 0.4
16.6	51.93 .23	42.3 0.5	30.35 .31	48.7 1.6	63.22 .21	37.5 0.9	10.85 .23	21.0 0.1	51.43 .24	40.1 0.2
26.6	52.15 .20	42.8 0.4	30.64 .27	50.4 1.7	63.41 .18	38.6 1.2	11.07 .21	21.0 0.0	51.66 .22	40.2 0.1
Nov. 5.6	52.33 .17	43.2 0.3	30.90 .23	52.1 1.8	63.58 .16	39.8 1.4	11.26 .18	21.0 0.1	51.87 .19	40.3 0.1
15.5	52.49 .14	43.5 0.2	31.11 .19	53.8 1.8	63.73 .13	41.3 1.5	11.43 .15	20.8 0.2	52.05 .16	40.4 0.0
25.5	52.62 .11	43.7 0.2	31.27 .14	55.6 1.7	63.83 .09	42.8 1.6	11.56 .12	20.6 0.3	52.20 .13	40.3 0.1
Dec. 5.5	52.71 .07	43.8 0.1	31.38 .08	57.3 1.7	63.91 .06	44.4 1.6	11.66 .08	20.3 0.3	52.31 .09	40.2 0.1
15.4	52.76 .03	43.9 0.1	31.44 .03	58.9 1.6	63.95 .02	46.0 1.6	11.73 .04	19.9 0.3	52.38 .05	40.1 0.1
25.4	52.77 .01	43.9 0.0	31.44 .03	60.3 1.4	63.95 .02	47.6 1.5	11.75 .00	19.6 0.4	52.41 .01	39.9 0.2
35.4	52.74 .05	43.9 0.1	31.38 .09	61.6 1.1	63.91 .06	49.0 1.4	11.73 .04	19.2 0.4	52.41 .03	39.7 0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*δ* Mensæ.		*m* Persei.		*α* Tauri. (*Aldebaran.*)		*τ* Tauri.		*α* Camelopardalis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 4 24	° ′ −80 26	h m 4 26	° ′ +42 50	h m 4 30	° ′ +16 18	h m 4 36	° ′ +22 45	h m 4 44	° ′ +66 10
	s	″	s	″	s	″	s	″	s	″
Jan. 0.4	48.85 .92	63.9 2.7	25.71 .02	68.6 1.1	13.31 .01	32.3 0.3	17.08 .00	57.7 0.0	11.53 .07	31.1 2.3
10.4	47.84 1.11	66.4 2.2	25.66 .08	69.6 0.9	13.28 .05	32.0 0.3	17.05 .04	57.7 0.0	11.42 .17	33.3 2.0
20.4	46.65 1.26	68.3 1.7	25.56 .13	70.4 0.7	13.22 .08	31.7 0.3	16.99 .09	57.7 0.1	11.20 .26	35.1 1.7
30.3	45.33 1.38	69.8 1.2	25.41 .17	71.0 0.5	13.11 .12	31.3 0.3	16.88 .12	57.6 0.2	10.90 .34	36.6 1.3
Feb. 9.3	43.91 1.46	70.7 0.6	25.22 .21	71.3 0.2	12.98 .15	31.0 0.3	16.75 .15	57.4 0.2	10.53 .40	37.8 0.9
19.3	42.43 1.49	71.0 0.1	25.00 .23	71.4 0.1	12.82 .17	30.7 0.3	16.58 .17	57.2 0.3	10.10 .44	38.4 0.4
Mar. 1.3	40.94 1.49	70.8 0.5	24.77 .24	71.1 0.4	12.65 .18	30.3 0.4	16.40 .18	56.9 0.3	9.64 .47	38.5 0.1
11.2	39.46 1.45	70.0 1.0	24.53 .23	70.6 0.7	12.47 .18	30.0 0.3	16.22 .18	56.6 0.4	9.17 .47	38.2 0.6
21.2	38.04 1.38	68.7 1.5	24.30 .21	69.8 0.9	12.30 .16	29.6 0.3	16.04 .17	56.2 0.4	8.72 .44	37.4 1.1
31.2	36.71 1.27	67.0 2.0	24.10 .18	68.8 1.1	12.14 .14	29.3 0.3	15.87 .15	55.7 0.5	8.30 .39	36.1 1.5
Apr. 10.1	35.50 1.14	64.8 2.4	23.94 .14	67.6 1.3	12.02 .11	29.1 0.2	15.74 .12	55.2 0.5	7.94 .32	34.5 1.8
20.1	34.44 .97	62.3 2.7	23.82 .09	66.3 1.4	11.93 .07	28.9 0.1	15.64 .08	54.8 0.4	7.66 .24	32.5 2.1
30.1	33.56 .79	59.4 3.0	23.75 .04	64.9 1.4	11.88 .03	28.8 0.0	15.58 .03	54.4 0.3	7.47 .14	30.3 2.3
May 10.1	32.87 .58	56.3 3.2	23.75 .02	63.6 1.4	11.87 .02	28.9 0.1	15.57 .01	54.1 0.3	7.38 .04	28.0 2.4
20.0	32.39 .37	53.0 3.4	23.80 .08	62.3 1.3	11.91 .06	29.0 0.2	15.61 .06	53.9 0.2	7.39 .06	25.6 2.4
30.0	32.14 .15	49.6 3.4	23.91 .14	61.0 1.2	12.00 .11	29.3 0.4	15.70 .11	53.8 0.0	7.50 .16	23.2 2.4
June 9.0	32.10 .08	46.2 3.4	24.08 .20	59.9 1.0	12.13 .15	29.8 0.5	15.83 .16	53.8 0.1	7.71 .26	20.9 2.2
19.0	32.29 .30	42.8 3.3	24.31 .25	59.0 0.8	12.30 .19	30.4 0.6	16.00 .20	54.0 0.3	8.02 .35	18.7 2.0
28.9	32.71 .52	39.6 3.1	24.58 .29	58.4 0.6	12.51 .23	31.1 0.7	16.22 .23	54.3 0.4	8.42 .43	16.8 1.8
July 8.9	33.32 .71	36.7 2.8	24.89 .33	57.9 0.4	12.75 .26	31.9 0.8	16.46 .26	54.8 0.5	8.89 .50	15.1 1.5
18.9	34.12 .89	34.1 2.4	25.23 .35	57.6 0.1	13.02 .28	32.7 0.9	16.74 .29	55.3 0.6	9.43 .56	13.7 1.2
28.8	35.09 1.04	31.9 2.0	25.59 .38	57.6 0.1	13.30 .29	33.6 0.9	17.03 .30	56.0 0.7	10.01 .61	12.7 0.9
Aug. 7.8	36.19 1.16	30.2 1.5	25.97 .39	57.7 0.3	13.60 .30	34.5 0.9	17.34 .31	56.7 0.7	10.64 .65	12.0 0.5
17.8	37.40 1.24	29.0 0.9	26.37 .39	58.1 0.5	13.91 .31	35.4 0.8	17.65 .32	57.4 0.7	11.30 .67	11.6 0.2
27.8	38.67 1.29	28.4 0.3	26.76 .39	58.7 0.7	14.21 .31	36.2 0.7	17.97 .32	58.1 0.7	11.97 .68	11.6 0.2
Sept. 6.7	39.96 1.29	28.4 0.3	27.15 .39	59.4 0.8	14.52 .30	36.9 0.6	18.29 .31	58.7 0.6	12.65 .68	12.0 0.5
16.7	41.23 1.24	29.0 0.9	27.53 .38	60.3 0.9	14.82 .29	37.5 0.5	18.60 .31	59.3 0.6	13.32 .67	12.7 0.9
26.7	42.43 1.16	30.3 1.5	27.90 .36	61.3 1.1	15.10 .28	37.9 0.4	18.90 .29	59.9 0.5	13.98 .64	13.7 1.2
Oct. 6.7	43.53 1.03	32.1 2.1	28.25 .34	62.4 1.2	15.37 .26	38.2 0.2	19.18 .28	60.4 0.4	14.60 .61	15.1 1.5
16.6	44.48 .87	34.4 2.6	28.58 .31	63.6 1.2	15.63 .24	38.4 0.1	19.45 .26	60.7 0.3	15.19 .57	16.7 1.8
26.6	45.24 .66	37.2 3.0	28.88 .28	64.8 1.3	15.86 .22	38.4 0.0	19.71 .24	61.0 0.3	15.74 .52	18.6 2.0
Nov. 5.6	45.80 .44	40.4 3.3	29.15 .25	66.2 1.3	16.07 .20	38.3 0.1	19.93 .21	61.3 0.2	16.22 .45	20.8 2.2
15.5	46.11 .19	43.7 3.4	29.38 .21	67.5 1.4	16.25 .17	38.2 0.2	20.13 .18	61.4 0.2	16.63 .38	23.1 2.4
25.5	46.18 .06	47.2 3.5	29.57 .17	68.9 1.4	16.41 .14	37.9 0.3	20.29 .15	61.6 0.1	16.96 .29	25.6 2.5
Dec. 5.5	46.00 .31	50.6 3.4	29.71 .12	70.3 1.4	16.52 .10	37.6 0.3	20.42 .11	61.7 0.1	17.21 .20	28.1 2.5
15.5	45.56 .52	54.0 3.2	29.80 .06	71.6 1.3	16.60 .06	37.3 0.3	20.51 .07	61.8 0.1	17.36 .10	30.6 2.5
25.4	44.89 .79	57.0 2.9	29.83 .01	72.8 1.2	16.64 .02	37.0 0.3	20.56 .03	61.8 0.0	17.40 .01	33.1 2.4
35.4	44.00 .99	59.7 2.5	29.81 .05	74.0 1.1	16.64 .03	36.7 0.3	20.56 .02	61.8 0.0	17.34 .11	35.4 2.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*i* Tauri.		ι Aurigæ.		ζ Aurigæ.		11 Orionis.		β Eridani.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	4 45	+18 40	4 50	+33 0	4 55	+40 55	4 58	+15 15	5 2	− 5 12
	s	″	s	″	s	″	s	″	s	″
Jan. 0.4	33.89 .01	13.0 0.2	31.64 .01	32.1 0.6	32.32 .01	52.5 1.1	53.74 .02	54.3 0.4	58.29 .01	58.7 1.5
10.4	33.88 .03	12.8 0.2	31.63 .04	32.6 0.5	32.30 .04	53.5 1.0	53.74 .02	54.0 0.4	58.28 .03	60.2 1.4
20.4	33.82 .08	12.5 0.2	31.57 .09	33.1 0.4	32.23 .10	54.4 0.8	53.70 .07	53.6 0.4	58.23 .07	61.5 1.2
30.4	33.73 .12	12.3 0.2	31.46 .13	33.4 0.3	32.11 .14	55.1 0.6	53.61 .11	53.2 0.3	58.13 .11	62.6 1.0
Feb. 9.3	33.59 .15	12.1 0.2	31.31 .16	33.6 0.1	31.95 .18	55.6 0.4	53.48 .14	52.9 0.3	58.01 .14	63.5 0.8
19.3	33.44 .17	11.8 0.3	31.13 .19	33.7 0.0	31.75 .21	55.8 0.1	53.33 .16	52.6 0.3	57.85 .16	64.2 0.6
Mar. 1.3	33.26 .18	11.5 0.3	30.93 .20	33.5 0.2	31.52 .23	55.8 0.2	53.16 .17	52.4 0.3	57.68 .18	64.6 0.4
11.2	33.08 .18	11.2 0.3	30.73 .20	33.2 0.4	31.29 .23	55.5 0.4	52.98 .18	52.1 0.3	57.50 .18	64.9 0.2
21.2	32.90 .17	10.9 0.3	30.53 .19	32.7 0.5	31.06 .22	55.0 0.6	52.81 .17	51.8 0.2	57.32 .17	64.9 0.1
31.2	32.74 .15	10.6 0.3	30.34 .17	32.1 0.7	30.85 .20	54.2 0.8	52.64 .16	51.6 0.2	57.15 .16	64.6 0.3
Apr. 10.2	32.60 .12	10.3 0.3	30.18 .14	31.4 0.8	30.67 .16	53.3 1.0	52.50 .13	51.5 0.1	57.01 .14	64.2 0.6
20.1	32.50 .08	10.0 0.2	30.06 .10	30.6 0.8	30.53 .12	52.2 1.1	52.39 .09	51.4 0.1	56.89 .10	63.5 0.8
30.1	32.44 .04	9.8 0.1	29.98 .05	29.7 0.9	30.44 .07	51.0 1.2	52.31 .05	51.4 0.0	56.80 .07	62.7 1.0
May 10.1	32.42 .00	9.7 0.0	29.96 .00	28.9 0.8	30.40 .01	49.8 1.2	52.28 .01	51.4 0.1	56.76 .03	61.6 1.2
20.1	32.45 .05	9.8 0.1	29.98 .05	28.1 0.7	30.42 .05	48.6 1.2	52.30 .04	51.6 0.3	56.75 .02	60.3 1.4
30.0	32.52 .10	9.9 0.2	30.06 .10	27.4 0.7	30.49 .10	47.4 1.1	52.36 .08	51.9 0.4	56.79 .06	58.9 1.5
June 9.0	32.64 .14	10.2 0.3	30.19 .15	26.8 0.5	30.62 .16	46.4 1.0	52.46 .12	52.4 0.5	56.88 .10	57.3 1.6
19.0	32.80 .18	10.6 0.4	30.36 .20	26.3 0.4	30.81 .21	45.4 0.9	52.60 .16	52.9 0.6	57.00 .14	55.6 1.7
28.9	33.00 .22	11.1 0.5	30.58 .24	26.0 0.2	31.04 .25	44.6 0.7	52.79 .20	53.5 0.7	57.16 .18	53.9 1.7
July 8.9	33.23 .25	11.7 0.6	30.84 .27	25.8 0.1	31.31 .29	44.0 0.5	53.00 .23	54.3 0.8	57.36 .21	52.2 1.7
18.9	33.49 .27	12.4 0.7	31.12 .30	25.8 0.1	31.62 .32	43.6 0.3	53.25 .26	55.0 0.8	57.58 .24	50.5 1.6
28.9	33.77 .29	13.1 0.7	31.44 .32	25.9 0.2	31.96 .35	43.4 0.2	53.52 .28	55.8 0.8	57.82 .26	49.0 1.5
Aug. 7.8	34.07 .30	13.8 0.7	31.77 .34	26.2 0.3	32.32 .37	43.3 0.0	53.80 .29	56.6 0.8	58.09 .27	47.6 1.3
17.8	34.37 .31	14.5 0.7	32.11 .34	26.5 0.4	32.69 .38	43.4 0.2	54.09 .30	57.3 0.7	58.37 .28	46.4 1.1
27.8	34.68 .31	15.2 0.7	32.45 .35	27.0 0.5	33.07 .38	43.7 0.3	54.39 .30	58.0 0.6	58.65 .29	45.4 0.8
Sept. 6.8	34.99 .31	15.8 0.6	32.80 .34	27.5 0.5	33.45 .38	44.1 0.5	54.70 .30	58.5 0.5	58.93 .29	44.8 0.5
16.7	35.29 .30	16.4 0.5	33.14 .34	28.0 0.6	33.83 .38	44.6 0.6	55.00 .30	59.0 0.4	59.22 .28	44.5 0.1
26.7	35.59 .29	16.8 0.4	33.48 .33	28.6 0.6	34.20 .37	45.2 0.7	55.29 .29	59.2 0.2	59.49 .27	44.5 0.2
Oct. 6.7	35.87 .28	17.1 0.2	33.80 .32	29.2 0.6	34.56 .35	46.0 0.8	55.57 .28	59.4 0.1	59.76 .26	44.9 0.5
16.6	36.14 .26	17.2 0.1	34.11 .30	29.9 0.6	34.91 .33	46.8 0.9	55.84 .26	59.3 0.1	60.02 .25	45.6 0.8
26.6	36.39 .24	17.3 0.0	34.39 .27	30.5 0.7	35.22 .31	47.7 1.0	56.10 .24	59.2 0.2	60.26 .23	46.6 1.1
Nov. 5.6	36.62 .21	17.3 0.1	34.65 .25	31.2 0.7	35.52 .28	48.7 1.0	56.33 .22	58.9 0.3	60.48 .21	47.8 1.3
15.6	36.82 .18	17.2 0.1	34.88 .21	31.9 0.7	35.78 .24	49.8 1.1	56.54 .19	58.5 0.4	60.67 .18	49.3 1.5
25.5	36.99 .15	17.0 0.2	35.08 .18	32.6 0.7	36.00 .20	50.9 1.1	56.72 .16	58.1 0.4	60.84 .15	50.9 1.6
Dec. 5.5	37.12 .12	16.8 0.2	35.24 .14	33.2 0.7	36.17 .15	52.1 1.1	56.86 .13	57.7 0.5	60.97 .11	52.6 1.7
15.5	37.22 .07	16.6 0.2	35.35 .09	33.9 0.7	36.30 .10	53.2 1.1	56.97 .09	57.2 0.4	61.06 .07	54.3 1.7
25.5	37.27 .03	16.4 0.2	35.42 .04	34.6 0.6	36.37 .05	54.4 1.1	57.03 .04	56.8 0.4	61.11 .03	55.9 1.6
35.4	37.28 .01	16.2 0.2	35.43 .01	35.2 0.6	36.39 .01	55.4 1.0	57.05 .00	56.4 0.4	61.12 .01	57.4 1.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Aurigæ. (*Capella.*)		β Orionis. (*Rigel.*)		τ Orionis.		β Tauri.		χ Aurigæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	5 9	+45 53	5 9	− 8 18	5 12	− 6 56	5 19	+28 31	5 26	+32 7
	s	″	s	″	s	″	s	″	s	″
Jan. 0.4	21.42 .03	51.0 1.3	46.17 .01	64.5 1.7	47.33 .01	71.6 1.7	60.99 .04	24.1 0.4	16.01 .05	6.3 0.6
10.4	21.41 .03	52.3 1.2	46.16 .03	66.2 1.6	47.33 .03	73.1 1.5	61.00 .01	24.5 0.3	16.04 .00	6.8 0.5
20.4	21.35 .09	53.4 1.1	46.11 .07	67.6 1.4	47.28 .07	74.6 1.3	60.97 .06	24.8 0.3	16.01 .05	7.3 0.5
30.4	21.23 .15	54.4 0.9	46.02 .11	68.9 1.1	47.19 .11	75.8 1.1	60.89 .10	25.0 0.2	15.93 .10	7.8 0.4
Feb. 9.3	21.05 .20	55.1 0.6	45.89 .14	69.9 0.9	47.07 .14	76.7 0.9	60.77 .14	25.2 0.1	15.81 .14	8.2 0.3
19.3	20.84 .23	55.6 0.3	45.74 .16	70.7 0.6	46.92 .16	77.5 0.6	60.61 .17	25.3 0.0	15.65 .18	8.4 0.2
Mar. 1.3	20.60 .25	55.7 0.0	45.57 .18	71.2 0.4	46.74 .18	78.0 0.4	60.43 .19	25.3 0.1	15.46 .20	8.5 0.0
11.3	20.35 .26	55.6 0.3	45.38 .18	71.4 0.1	46.56 .18	78.3 0.1	60.23 .20	25.1 0.2	15.25 .20	8.4 0.2
21.2	20.09 .25	55.1 0.6	45.20 .18	71.4 0.1	46.38 .18	78.3 0.1	60.04 .19	24.9 0.3	15.05 .20	8.1 0.3
31.2	19.85 .23	54.4 0.9	45.02 .17	71.2 0.4	46.21 .17	78.1 0.3	59.85 .18	24.5 0.4	14.85 .19	7.7 0.4
Apr. 10.2	19.64 .19	53.4 1.1	44.87 .14	70.6 0.6	46.05 .14	77.6 0.6	59.68 .15	24.0 0.5	14.67 .16	7.2 0.6
20.1	19.48 .14	52.2 1.3	44.74 .11	69.9 0.9	45.92 .11	76.9 0.8	59.54 .12	23.5 0.6	14.53 .13	6.6 0.7
30.1	19.36 .09	50.9 1.4	44.65 .07	68.9 1.1	45.83 .07	76.0 1.0	59.45 .08	22.9 0.6	14.42 .09	5.9 0.7
May 10.1	19.30 .03	49.5 1.4	44.60 .03	67.7 1.3	45.78 .03	74.9 1.2	59.40 .03	22.3 0.6	14.36 .04	5.2 0.7
20.1	19.29 .03	48.0 1.4	44.59 .01	66.3 1.5	45.76 .01	73.5 1.4	59.39 .02	21.8 0.5	14.35 .01	4.5 0.7
30.0	19.35 .09	46.6 1.4	44.62 .05	64.7 1.6	45.79 .05	72.0 1.6	59.43 .07	21.3 0.5	14.39 .06	3.8 0.7
June 9.0	19.47 .15	45.2 1.3	44.69 .10	63.0 1.7	45.87 .09	70.4 1.7	59.53 .12	20.9 0.4	14.48 .11	3.1 0.6
19.0	19.65 .21	43.9 1.2	44.81 .13	61.2 1.8	45.98 .13	68.7 1.8	59.67 .16	20.6 0.3	14.61 .16	2.6 0.5
29.0	19.88 .26	42.8 1.1	44.96 .17	59.4 1.9	46.13 .17	66.9 1.8	59.85 .20	20.4 0.2	14.79 .20	2.2 0.4
July 8.9	20.16 .30	41.8 0.9	45.15 .20	57.5 1.8	46.32 .20	65.1 1.8	60.07 .24	20.3 0.1	15.01 .24	1.8 0.3
18.9	20.48 .33	41.0 0.7	45.37 .23	55.7 1.7	46.53 .23	63.4 1.7	60.32 .27	20.3 0.0	15.27 .27	1.6 0.2
28.9	20.83 .36	40.4 0.5	45.61 .25	54.1 1.6	46.77 .25	61.8 1.5	60.60 .29	20.3 0.1	15.55 .29	1.5 0.1
Aug. 7.8	21.21 .39	40.0 0.3	45.87 .27	52.6 1.4	47.03 .27	60.3 1.3	60.90 .31	20.5 0.2	15.86 .31	1.5 0.0
17.8	21.60 .40	39.8 0.1	46.14 .28	51.3 1.1	47.30 .28	59.1 1.1	61.21 .32	20.7 0.2	16.18 .33	1.5 0.1
27.8	22.01 .41	39.8 0.1	46.42 .28	50.3 0.8	47.58 .28	58.1 0.8	61.54 .33	21.0 0.3	16.51 .34	1.6 0.2
Sept. 6.8	22.42 .41	40.0 0.3	46.70 .29	49.7 0.5	47.86 .29	57.5 0.5	61.87 .33	21.2 0.3	16.85 .34	1.8 0.2
16.7	22.83 .41	40.4 0.4	46.99 .28	49.4 0.1	48.15 .28	57.2 0.1	62.20 .33	21.5 0.3	17.20 .34	2.0 0.2
26.7	23.23 .40	40.9 0.6	47.27 .28	49.4 0.3	48.43 .28	57.2 0.2	62.53 .33	21.8 0.3	17.54 .34	2.3 0.3
Oct. 6.7	23.63 .39	41.6 0.8	47.54 .27	49.9 0.6	48.70 .27	57.6 0.6	62.85 .32	22.0 0.2	17.87 .33	2.5 0.3
16.7	24.01 .37	42.4 0.9	47.80 .25	50.7 1.0	48.96 .25	58.4 0.9	63.16 .30	22.3 0.2	18.20 .32	2.8 0.3
26.6	24.36 .34	43.3 1.0	48.04 .23	51.8 1.3	49.21 .24	59.5 1.2	63.45 .28	22.5 0.2	18.51 .30	3.1 0.3
Nov. 5.6	24.69 .31	44.4 1.1	48.27 .21	53.2 1.5	49.43 .21	60.8 1.4	63.72 .26	22.7 0.2	18.79 .28	3.5 0.4
15.6	24.99 .27	45.6 1.3	48.46 .18	54.8 1.7	49.64 .19	62.4 1.6	63.97 .24	23.0 0.3	19.06 .25	3.9 0.4
25.5	25.24 .23	46.9 1.3	48.63 .15	56.6 1.8	49.81 .16	64.1 1.8	64.19 .20	23.3 0.3	19.29 .22	4.3 0.5
Dec. 5.5	25.45 .18	48.3 1.4	48.77 .11	58.4 1.9	49.95 .12	65.9 1.8	64.38 .16	23.5 0.3	19.49 .17	4.8 0.5
15.5	25.60 .12	49.7 1.4	48.86 .08	60.3 1.9	50.05 .08	67.7 1.8	64.52 .12	23.8 0.3	19.64 .15	5.3 0.5
25.5	25.69 .06	51.1 1.4	48.92 .04	62.1 1.8	50.11 .04	69.4 1.7	64.61 .07	24.2 0.3	19.74 .08	5.9 0.6
35.4	25.72 .00	52.5 1.3	48.94 .01	63.8 1.7	50.13 .01	71.1 1.6	64.66 .02	24.5 0.4	19.80 .03	6.4 0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 966.		δ Orionis.		α Leporis.		Groombridge 944.		ε Orionis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 5 26	° ′ +74 58	h m 5 26	° ′ – 0 22	h m 5 28	° ′ –17 53	h m 5 29	° ′ +85 8	h m 5 31	° ′ – 1 15
	s	″	s	″	s	″	s	″	s	″
Jan. 0.5	28.86 .00	44.5 2.7	56.22 .04	25.7 1.4	21.46 .02	42.1 2.3	76.44 .18	54.3 3.1	10.71 .04	59.3 1.4
10.4	28.78 .17	47.2 2.6	56.23 .01	27.0 1.2	21.46 .03	44.3 2.0	76.01 .68	57.3 2.9	10.72 .01	60.6 1.3
20.4	28.52 .33	49.7 2.3	56.20 .05	28.2 1.1	21.41 .07	46.2 1.8	75.09 1.16	60.1 2.6	10.69 .05	61.8 1.1
30.4	28.12 .47	51.8 2.0	56.12 .09	29.2 0.9	21.32 .11	47.8 1.5	73.71 1.58	62.5 2.2	10.62 .09	62.9 1.0
Feb. 9.3	27.59 .59	53.6 1.6	56.01 .13	30.0 0.7	21.19 .15	49.2 1.2	71.94 1.94	64.6 1.8	10.51 .13	63.7 0.8
19.3	26.95 .68	54.9 1.1	55.87 .15	30.6 0.6	21.02 .17	50.3 0.9	69.86 2.21	66.1 1.2	10.37 .15	64.4 0.6
Mar. 1.3	26.23 .74	55.7 0.5	55.71 .17	31.1 0.4	20.84 .19	51.0 0.5	67.55 2.38	67.1 0.6	10.21 .17	64.9 0.4
11.3	25.48 .76	55.9 0.0	55.53 .18	31.4 0.2	20.64 .20	51.3 0.2	65.13 2.45	67.4 0.0	10.03 .18	65.2 0.2
21.2	24.72 .75	55.6 0.6	55.35 .18	31.5 0.0	20.44 .20	51.3 0.2	62.69 2.41	67.2 0.5	9.85 .18	65.3 0.0
31.2	23.99 .70	54.8 1.1	55.18 .17	31.4 0.2	20.25 .19	51.0 0.5	60.34 2.27	66.3 1.1	9.68 .17	65.2 0.2
Apr. 10.2	23.32 .62	53.5 1.6	55.02 .15	31.1 0.3	20.08 .16	50.4 0.8	58.17 2.05	65.0 1.6	9.52 .15	64.9 0.4
20.2	22.75 .52	51.7 2.0	54.89 .12	30.7 0.5	19.93 .13	49.4 1.1	56.27 1.74	63.1 2.1	9.39 .12	64.5 0.5
30.1	22.30 .39	49.6 2.3	54.79 .08	30.1 0.7	19.81 .10	48.2 1.4	54.71 1.36	60.8 2.5	9.29 .08	63.9 0.7
May 10.1	21.98 .25	47.1 2.5	54.73 .04	29.3 0.9	19.73 .06	46.7 1.6	53.55 .95	58.1 2.8	9.22 .04	63.0 0.9
20.1	21.81 .10	44.5 2.7	54.72 .00	28.3 1.0	19.69 .02	44.9 1.9	52.82 .50	55.3 3.0	9.20 .00	62.0 1.1
30.0	21.79 .06	41.8 2.7	54.74 .04	27.2 1.2	19.70 .03	43.0 2.0	52.55 .04	52.3 3.0	9.22 .04	60.9 1.2
June 9.0	21.93 .21	39.1 2.7	54.80 .09	26.0 1.3	19.74 .07	40.9 2.2	52.74 .42	49.2 3.0	9.28 .08	59.6 1.3
19.0	22.21 .36	36.4 2.6	54.91 .13	24.6 1.4	19.83 .11	38.7 2.2	53.38 .87	46.2 3.0	9.38 .12	58.2 1.4
29.0	22.65 .50	33.8 2.5	55.05 .16	23.2 1.4	19.96 .15	36.4 2.3	54.47 1.29	43.2 2.8	9.52 .16	56.8 1.5
July 8.9	23.21 .62	31.5 2.3	55.23 .19	21.8 1.4	20.13 .18	34.2 2.2	55.96 1.69	40.5 2.6	9.69 .19	55.3 1.5
18.9	23.89 .73	29.3 2.0	55.44 .22	20.4 1.4	20.33 .21	32.0 2.1	57.83 2.04	38.1 2.3	9.90 .22	53.9 1.4
28.9	24.67 .82	27.5 1.7	55.67 .24	19.0 1.3	20.56 .24	30.0 1.9	60.02 2.34	35.9 2.0	10.13 .24	52.5 1.3
Aug. 7.9	25.54 .90	26.0 1.3	55.93 .26	17.8 1.1	20.81 .26	28.2 1.6	62.50 2.60	34.1 1.6	10.38 .26	51.3 1.2
17.8	26.47 .96	24.8 1.0	56.19 .27	16.8 0.9	21.07 .27	26.8 1.3	65.20 2.80	32.7 1.2	10.64 .27	50.2 1.0
27.8	27.46 1.00	24.1 0.6	56.47 .28	16.0 0.7	21.35 .28	25.6 0.9	68.08 2.95	31.7 0.8	10.92 .28	49.4 0.7
Sept. 6.8	28.48 1.03	23.7 0.2	56.75 .29	15.4 0.4	21.64 .29	24.9 0.5	71.08 3.04	31.2 0.3	11.20 .28	48.8 0.4
16.7	29.51 1.03	23.7 0.2	57.04 .29	15.1 0.1	21.93 .29	24.5 0.1	74.14 3.07	31.1 0.1	11.48 .28	48.5 0.1
26.7	30.54 1.02	24.1 0.6	57.32 .28	15.1 0.2	22.22 .29	24.7 0.3	77.20 3.04	31.5 0.6	11.77 .28	48.5 0.2
Oct. 6.7	31.55 1.00	25.0 1.0	57.60 .27	15.4 0.4	22.50 .28	25.2 0.8	80.20 2.95	32.3 1.0	12.05 .27	48.8 0.5
16.7	32.53 .95	26.2 1.4	57.87 .26	16.0 0.7	22.77 .26	26.3 1.2	83.08 2.80	33.6 1.5	12.32 .26	49.5 0.8
26.6	33.44 .88	27.7 1.7	58.13 .25	16.8 1.0	23.03 .25	27.7 1.6	85.78 2.58	35.3 1.9	12.58 .25	50.4 1.0
Nov. 5.6	34.27 .79	29.7 2.1	58.37 .23	17.9 1.2	23.26 .23	29.4 1.9	88.23 2.31	37.4 2.3	12.82 .23	51.5 1.2
15.6	35.01 .68	31.9 2.4	58.58 .20	19.2 1.3	23.48 .20	31.5 2.2	90.37 1.97	39.8 2.6	13.04 .21	52.8 1.4
25.6	35.63 .56	34.4 2.6	58.77 .17	20.6 1.4	23.66 .17	33.8 2.3	92.13 1.57	42.6 2.9	13.23 .18	54.3 1.5
Dec. 5.5	36.12 .42	37.0 2.7	58.93 .14	22.1 1.5	23.81 .13	36.2 2.4	93.49 1.12	45.5 3.1	13.39 .14	55.8 1.6
15.5	36.46 .26	39.8 2.8	59.05 .10	23.5 1.5	23.92 .09	38.6 2.4	94.37 .64	48.7 3.2	13.51 .10	57.4 1.5
25.5	36.64 .09	42.7 2.8	59.13 .06	25.0 1.4	23.98 .04	40.9 2.3	94.75 .13	51.9 3.2	13.60 .06	58.9 1.5
35.4	36.65 .07	45.5 2.7	59.17 .02	26.4 1.3	24.00 .00	43.2 2.2	94.62 .39	55.0 3.1	13.64 .02	60.3 1.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Columbæ.		κ Orionis.		ν Aurigæ.		δ Doradus.		α Orionis.	
	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	h m 5 36	° ′ −34 7	h m 5 43	° ′ − 9 42	h m 5 44	° ′ +39 7	h m 5 44	° ′ −65 46	h m 5 49	° ′ + 7 23
	s	″	s	″	s	″	s	″	s	″
Jan. 0.5	4.01 .00	44.2 2.9	3.16 .04	22.2 1.9	36.69 .07	9.5 1.0	38.86 .14	29.4 3.5	47.95 .07	15.9 1.0
10.4	3.99 .05	47.0 2.7	3.18 .00	24.0 1.8	36.73 .01	10.5 0.9	38.67 .24	32.8 3.2	47.99 .02	14.9 0.9
20.4	3.91 .10	49.5 2.4	3.15 .05	25.7 1.6	36.72 .04	11.4 0.9	38.39 .33	35.8 2.9	47.98 .03	14.1 0.8
30.4	3.78 .15	51.7 2.0	3.08 .09	27.1 1.3	36.65 .10	12.3 0.8	38.02 .41	38.5 2.4	47.93 .07	13.4 0.6
Feb. 9.4	3.61 .19	53.5 1.6	2.97 .13	28.3 1.0	36.52 .15	13.0 0.6	37.58 .47	40.7 2.0	47.83 .11	12.8 0.5
19.3	3.41 .22	54.9 1.2	2.83 .16	29.2 0.8	36.35 .19	13.5 0.4	37.08 .52	42.4 1.4	47.70 .14	12.4 0.4
Mar. 1.3	3.18 .24	55.8 0.7	2.66 .18	29.9 0.5	36.15 .21	13.9 0.2	36.54 .56	43.6 0.9	47.55 .16	12.0 0.3
11.3	2.94 .25	56.3 0.3	2.48 .19	30.3 0.2	35.93 .23	14.0 0.0	35.97 .57	44.2 0.3	47.38 .18	11.8 0.2
21.2	2.70 .24	56.3 0.2	2.29 .19	30.4 0.0	35.71 .23	13.9 0.2	35.40 .57	44.2 0.2	47.20 .18	11.7 0.1
31.2	2.46 .23	55.9 0.6	2.11 .18	30.2 0.3	35.48 .22	13.5 0.4	34.84 .55	43.7 0.7	47.02 .17	11.7 0.0
Apr. 10.2	2.23 .21	55.0 1.0	1.94 .16	29.8 0.5	35.28 .19	12.9 0.6	34.30 .52	42.7 1.2	46.86 .15	11.7 0.1
20.2	2.04 .18	53.8 1.4	1.79 .13	29.2 0.8	35.11 .15	12.2 0.8	33.81 .47	41.3 1.7	46.72 .12	11.9 0.2
30.1	1.88 .14	52.1 1.8	1.68 .10	28.3 1.0	34.97 .11	11.4 0.9	33.36 .41	39.3 2.1	46.61 .09	12.2 0.4
May 10.1	1.76 .10	50.1 2.1	1.60 .06	27.1 1.2	34.89 .06	10.4 1.0	32.99 .34	37.0 2.5	46.54 .05	12.6 0.5
20.1	1.68 .05	47.9 2.4	1.56 .02	25.8 1.4	34.85 .01	9.3 1.1	32.70 .25	34.3 2.8	46.51 .01	13.2 0.6
30.1	1.65 .01	45.4 2.6	1.56 .02	24.3 1.6	34.87 .04	8.3 1.1	32.49 .17	31.3 3.1	46.52 .03	13.8 0.7
June 9.0	1.67 .04	42.7 2.8	1.60 .06	22.6 1.7	34.94 .10	7.2 1.0	32.37 .08	28.1 3.3	46.57 .07	14.6 0.8
19.0	1.74 .09	39.8 2.8	1.68 .10	20.8 1.8	35.06 .15	6.2 1.0	32.34 .02	24.8 3.4	46.66 .11	15.4 0.9
29.0	1.85 .13	37.0 2.8	1.81 .14	19.0 1.9	35.24 .20	5.3 0.9	32.40 .11	21.4 3.3	46.79 .15	16.3 1.0
July 8.9	2.00 .17	34.2 2.8	1.96 .17	17.1 1.8	35.45 .24	4.5 0.8	32.55 .20	18.1 3.2	46.96 .18	17.3 0.9
18.9	2.20 .21	31.5 2.6	2.15 .20	15.3 1.7	35.71 .27	3.8 0.6	32.79 .28	15.0 3.0	47.15 .21	18.2 0.9
28.9	2.42 .24	29.0 2.3	2.37 .23	13.6 1.6	36.00 .30	3.2 0.5	33.11 .35	12.1 2.8	47.37 .23	19.1 0.9
Aug. 7.9	2.68 .27	26.8 2.0	2.61 .25	12.1 1.4	36.32 .33	2.7 0.4	33.50 .42	9.5 2.4	47.62 .25	20.0 0.8
17.8	2.96 .29	25.0 1.6	2.87 .26	10.8 1.2	36.65 .35	2.4 0.3	33.95 .48	7.3 1.9	47.88 .27	20.7 0.7
27.8	3.26 .31	23.6 1.1	3.14 .27	9.8 0.9	37.01 .36	2.2 0.2	34.45 .52	5.7 1.4	48.15 .28	21.3 0.5
Sept. 6.8	3.57 .31	22.7 0.6	3.42 .28	9.1 0.5	37.37 .37	2.0 0.1	34.99 .55	4.6 0.8	48.44 .29	21.7 0.3
16.8	3.89 .32	22.3 0.1	3.70 .29	8.8 0.1	37.74 .37	2.0 0.0	35.55 .56	4.2 0.1	48.73 .29	21.9 0.1
26.7	4.21 .32	22.5 0.5	3.98 .28	8.9 0.3	38.11 .37	2.1 0.1	36.12 .56	4.4 0.5	49.02 .29	21.9 0.1
Oct. 6.7	4.52 .31	23.3 1.0	4.27 .28	9.3 0.6	38.48 .37	2.3 0.2	36.67 .54	5.2 1.2	49.31 .29	21.7 0.4
16.7	4.82 .29	24.6 1.5	4.54 .27	10.1 1.0	38.84 .36	2.6 0.3	37.20 .51	6.7 1.8	49.59 .28	21.2 0.6
26.6	5.10 .27	26.4 2.0	4.80 .26	11.3 1.3	39.19 .34	2.9 0.4	37.69 .46	8.8 2.4	49.86 .27	20.5 0.8
Nov. 5.6	5.36 .24	28.6 2.4	5.05 .24	12.7 1.6	39.52 .32	3.4 0.5	38.12 .40	11.4 2.8	50.12 .25	19.7 0.9
15.6	5.58 .21	31.2 2.8	5.27 .21	14.5 1.8	39.82 .29	4.0 0.6	38.48 .32	14.5 3.2	50.37 .23	18.7 1.0
25.6	5.77 .17	34.1 3.0	5.47 .18	16.4 2.0	40.09 .25	4.7 0.7	38.75 .23	17.9 3.5	50.58 .20	17.7 1.1
Dec. 5.5	5.92 .13	37.1 3.1	5.64 .15	18.4 2.0	40.33 .21	5.5 0.8	38.94 .13	21.5 3.7	50.77 .17	16.5 1.1
15.5	6.03 .08	40.2 3.1	5.77 .11	20.4 2.1	40.51 .16	6.4 0.9	39.02 .03	25.2 3.7	50.92 .13	15.5 1.1
25.5	6.08 .03	43.3 3.0	5.86 .07	22.5 2.0	40.64 .11	7.3 1.0	38.99 .07	28.8 3.6	51.02 .09	14.4 1.0
35.5	6.08 .02	46.2 2.8	5.90 .02	24.4 1.8	40.72 .05	8.3 1.0	38.87 .18	32.3 3.4	51.09 .04	13.4 0.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Aurigæ.		θ Aurigæ.		ν Orionis.		22 Camelop. (H.)		η Geminorum.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 5 52	° ' +44 56	h m 5 52	° ' +37 12	h m 6 1	° ' +14 46	h m 6 7	° ' +69 20	h m 6 8	° ' +22 32
	s	"	s	"	s	"	s	"	s	"
Jan. 0.5	15.06 .09	14.5 1.3	57.23 .08	19.7 0.9	54.35 .08	46.9 0.6	55.82 .13	78.0 2.5	53.24 .09	6.3 0.1
10.4	15.11 .02	15.8 1.3	57.29 .02	20.5 0.8	54.40 .03	46.4 0.5	55.89 .01	80.5 2.5	53.30 .04	6.2 0.0
20.4	15.10 .05	17.1 1.2	57.28 .03	21.4 0.8	54.41 .02	45.9 0.4	55.83 .12	83.0 2.4	53.32 .01	6.3 0.0
30.4	15.02 .11	18.2 1.1	57.22 .09	22.1 0.7	54.37 .06	45.6 0.3	55.65 .24	85.2 2.1	53.28 .06	6.3 0.1
Feb. 9.4	14.89 .16	19.2 0.9	57.11 .14	22.8 0.6	54.28 .10	45.3 0.2	55.35 .35	87.2 1.8	53.20 .10	6.4 0.1
19.3	14.71 .20	20.0 0.7	56.95 .18	23.3 0.5	54.16 .14	45.1 0.2	54.96 .44	88.8 1.4	53.08 .14	6.5 0.1
Mar. 1.3	14.49 .23	20.5 0.4	56.76 .20	23.7 0.3	54.01 .16	44.9 0.1	54.49 .50	90.0 1.0	52.92 .17	6.6 0.0
11.3	14.25 .25	20.8 0.1	56.55 .22	23.8 0.0	53.83 .18	44.8 0.1	53.97 .54	90.7 0.5	52.74 .18	6.6 0.0
21.3	13.99 .25	20.7 0.2	56.32 .22	23.8 0.2	53.65 .18	44.7 0.1	53.42 .55	90.9 0.0	52.55 .19	6.6 0.1
31.2	13.74 .24	20.4 0.5	56.11 .21	23.5 0.4	53.47 .18	44.7 0.0	52.88 .54	90.7 0.5	52.37 .18	6.5 0.1
Apr. 10.2	13.51 .21	19.8 0.7	55.91 .19	23.1 0.5	53.31 .16	44.6 0.0	52.36 .49	89.9 1.0	52.19 .17	6.4 0.1
20.2	13.31 .18	19.0 0.9	55.73 .16	22.5 0.7	53.16 .13	44.6 0.0	51.90 .43	88.7 1.4	52.03 .14	6.2 0.2
30.1	13.16 .13	17.9 1.1	55.60 .11	21.7 0.8	53.04 .10	44.7 0.1	51.50 .35	87.1 1.8	51.91 .11	6.0 0.2
May 10.1	13.05 .08	16.7 1.2	55.51 .07	20.8 0.9	52.96 .06	44.8 0.1	51.20 .26	85.1 2.1	51.82 .07	5.8 0.2
20.1	13.00 .02	15.4 1.3	55.46 .02	19.9 0.9	52.92 .02	45.0 0.2	51.00 .15	82.9 2.3	51.77 .03	5.6 0.2
30.1	13.01 .04	14.1 1.4	55.47 .03	18.9 1.0	52.93 .02	45.2 0.3	50.90 .04	80.5 2.5	51.77 .02	5.4 0.2
June 9.0	13.07 .09	12.7 1.4	55.54 .09	18.0 0.9	52.97 .07	45.5 0.3	50.92 .07	78.0 2.6	51.81 .06	5.3 0.1
19.0	13.19 .15	11.4 1.3	55.65 .14	17.1 0.9	53.06 .11	45.9 0.4	51.04 .18	75.4 2.6	51.90 .11	5.2 0.1
29.0	13.37 .20	10.1 1.2	55.81 .18	16.2 0.8	53.18 .14	46.3 0.5	51.28 .28	72.9 2.5	52.02 .14	5.2 0.0
July 9.0	13.59 .24	8.9 1.1	56.01 .22	15.4 0.7	53.34 .18	46.8 0.5	51.61 .38	70.5 2.4	52.18 .18	5.2 0.0
18.9	13.85 .28	7.8 1.0	56.25 .26	14.8 0.6	53.54 .21	47.3 0.5	52.04 .47	68.2 2.2	52.38 .21	5.2 0.1
28.9	14.16 .32	6.9 0.8	56.53 .29	14.2 0.5	53.76 .23	47.8 0.5	52.55 .55	66.1 2.0	52.61 .24	5.3 0.1
Aug. 7.9	14.49 .35	6.2 0.7	56.83 .31	13.8 0.4	54.00 .25	48.3 0.5	53.14 .62	64.2 1.7	52.86 .26	5.4 0.1
17.8	14.85 .37	5.5 0.6	57.16 .33	13.4 0.3	54.26 .27	48.7 0.4	53.78 .67	62.7 1.4	53.13 .28	5.4 0.1
27.8	15.24 .39	5.1 0.4	57.50 .35	13.1 0.2	54.54 .28	49.1 0.3	54.48 .71	61.4 1.1	53.42 .30	5.5 0.0
Sept. 6.8	15.63 .40	4.8 0.2	57.85 .36	13.0 0.1	54.83 .29	49.3 0.1	55.21 .75	60.4 0.8	53.72 .31	5.5 0.0
16.8	16.03 .40	4.6 0.1	58.21 .36	12.9 0.1	55.13 .30	49.4 0.0	55.97 .77	59.8 0.4	54.03 .31	5.4 0.1
26.7	16.44 .40	4.6 0.1	58.58 .36	12.9 0.0	55.43 .30	49.3 0.2	56.74 .78	59.6 0.1	54.35 .31	5.3 0.2
Oct. 6.7	16.84 .40	4.8 0.2	58.94 .36	12.9 0.1	55.73 .30	49.0 0.3	57.52 .77	59.7 0.3	54.66 .31	5.1 0.2
16.7	17.24 .39	5.1 0.4	59.29 .35	13.1 0.2	56.03 .29	48.7 0.4	58.28 .75	60.2 0.7	54.97 .31	4.8 0.3
26.7	17.62 .37	5.5 0.5	59.64 .34	13.3 0.3	56.31 .28	48.2 0.5	59.02 .72	61.1 1.0	55.28 .30	4.5 0.3
Nov. 5.6	17.98 .35	6.2 0.7	59.97 .32	13.6 0.4	56.59 .27	47.6 0.6	59.72 .67	62.3 1.4	55.57 .29	4.1 0.4
15.6	18.32 .32	7.0 0.9	60.27 .29	14.1 0.5	56.85 .25	46.9 0.7	60.36 .61	63.9 1.7	55.85 .27	3.7 0.4
25.6	18.62 .28	7.9 1.0	60.54 .26	14.6 0.6	57.08 .22	46.2 0.7	60.93 .53	65.7 2.0	56.11 .24	3.4 0.3
Dec. 5.5	18.88 .23	9.0 1.1	60.78 .22	15.2 0.7	57.29 .19	45.4 0.7	61.42 .44	67.9 2.2	56.33 .20	3.1 0.3
15.5	19.08 .18	10.2 1.2	60.97 .17	16.0 0.7	57.46 .15	44.7 0.7	61.80 .33	70.2 2.4	56.51 .16	2.8 0.2
25.5	19.24 .12	11.4 1.3	61.11 .12	16.8 0.8	57.59 .11	44.1 0.6	62.06 .21	72.7 2.5	56.65 .12	2.7 0.1
35.5	19.32 .06	12.7 1.3	61.20 .06	17.6 0.9	57.67 .06	43.5 0.5	62.20 .08	75.3 2.6	56.75 .07	2.6 0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Geminorum.		ψ¹ Aurigæ.		α Argûs. (*Canopus.*)		ν Geminorum.		γ Geminorum.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 6 16	° ′ +22 33	h m 6 17	° ′ +49 20	h m 6 21	° ′ −52 38	h m 6 23	° ′ +20 16	h m 6 31	° ′ +16 28
	s	″	s	″	s	″	s	″	s	″
Jan. 0.5	57.39 .10	50.8 0.0	15.57 .12	18.4 1.5	46.64 .01	32.5 3.6	4.22 .10	28.2 0.2	58.74 .11	60.6 0.5
10.5	57.46 .05	50.8 0.0	15.66 .05	19.9 1.5	46.62 .06	36.0 3.4	4.30 .05	28.0 0.2	58 83 .06	60.1 0.4
20.4	57.49 .00	50.8 0.0	15.67 .02	21.4 1.5	46.52 .13	39.3 3.1	4.32 .00	27.8 0.1	58.86 .01	59 7 0.3
30.4	57.46 .05	50.8 0.1	15.62 .09	22.9 1.4	46.36 .19	42.2 2.8	4.30 .05	27.8 0.0	58.85 .04	59.5 0.2
Feb. 9.4	57.38 .09	50.9 0.1	15.49 .15	24.2 1.2	46.13 .25	44.8 2.4	4.23 .09	27.8 0.0	58.79 .09	59.3 0.1
19.4	57.26 .13	51.0 0.1	15.32 .20	25.3 1.0	45.86 .30	46.9 1.9	4.12 .13	27.8 0.0	58.68 .12	59.2 0.1
Mar. 1.3	57.11 .16	51.1 0.1	15.09 .24	26.1 0.7	45.54 .33	48.6 1.4	3.97 .16	27.9 0.0	58.54 .15	59.1 0.0
11.3	56.94 .18	51.2 0.0	14.83 .26	26.7 0.4	45.20 .35	49.7 0.9	3.80 .18	27.9 0.0	58.38 .17	59.1 0.0
21.3	56.75 .19	51.2 0.0	14.56 .28	26.9 0.0	44.84 .36	50.3 0.3	3.62 .18	27.9 0.0	58.20 .18	59.1 0.0
31.2	56.56 .18	51.1 0.1	14.28 .27	26.8 0.3	44.48 .36	50.4 0.2	3.43 .18	27.9 0.0	58.02 .18	59.1 0.0
Apr. 10.2	56.38 .17	51.0 0.1	14.02 .25	26.4 0.6	44.13 .34	49.9 0.7	3.26 .17	27.9 0.1	57.84 .16	59.2 0.0
20.2	56.22 .15	50.9 0.2	13.78 .21	25.7 0.9	43.80 .31	49.0 1.2	3.10 .14	27.8 0.1	57.68 .14	59.2 0.0
30.2	56.09 .11	50.7 0.2	13.59 .17	24.7 1.1	43.50 .27	47.6 1.6	2.97 .11	27.7 0.1	57.55 .11	59.2 0.0
May 10.1	56.00 .07	50.5 0.2	13.44 .12	23.4 1.3	43.25 .23	45.7 2.0	2.87 .08	27.6 0.1	57.45 .08	59.3 0.1
20.1	55.95 .03	50.3 0.2	13.35 .06	22.0 1.5	43.05 .18	43.4 2.4	2.81 .04	27.5 0.1	57.39 .04	59.4 0.1
30.1	55.94 .01	50.2 0.1	13.32 .00	20.5 1.6	42.90 .12	40.9 2.7	2.80 .00	27.5 0.0	57.37 .00	59.5 0.1
June 9.1	55.97 .05	50.0 0.1	13.35 .06	19.0 1.6	42.80 .06	38.0 2.9	2.82 .05	27.5 0.0	57.39 .04	59.7 0.2
19.0	56.05 .10	49.9 0.1	13.44 .12	17.3 1.6	42.78 .00	35.0 3.1	2.90 .09	27.5 0.0	57.44 .08	59.9 0.2
29.0	56.17 .14	49.8 0.0	13.59 .18	15.7 1.6	42.80 .06	31.8 3.2	3.00 .13	27.5 0.1	57.54 .12	60.2 0.3
July 9.0	56.32 .17	49.8 0.0	13.79 .23	14.2 1.5	42.90 .12	28.6 3.2	3.15 .16	27.6 0.1	57.68 .15	60.4 0.3
18.9	56.51 .20	49.8 0.0	14.04 .27	12.7 1.4	43.05 .18	25.5 3.0	3.33 .19	27.7 0.1	57.85 .18	60.7 0.3
28.9	56.73 .23	49.8 0.0	14.34 .31	11.4 1.3	43.25 .23	22.5 2.8	3.54 .22	27.9 0.1	58.05 .21	61.0 0.3
Aug. 7.9	56.98 .26	49.9 0.0	14.67 .35	10.2 1.1	43.50 .28	19.8 2.5	3.78 .25	28.0 0.1	58.27 .24	61.3 0.2
17.9	57.25 .28	49.9 0.0	15.04 .38	9.2 1.0	43.80 .32	17.5 2.2	4.04 .27	28.0 0.1	58.52 .26	61.5 0.2
27.8	57.53 .29	49.9 0.0	15.43 .40	8.3 0.8	44.14 .35	15.5 1.7	4.32 .28	28.1 0.0	58.78 .27	61.6 0.1
Sept. 6.8	57.83 .30	49.8 0.1	15.84 .42	7.6 0.6	44.51 .38	14.1 1.1	4.61 .30	28.0 0.1	59.06 .28	61.6 0.1
16.8	58.14 .31	49.7 0.2	16.27 .43	7.1 0.4	44.90 .40	13.3 0.5	4.91 .30	27.9 0.2	59.35 .29	61.4 0.2
26.8	58.45 .31	49.5 0.2	16.70 .44	6.8 0.2	45.30 .41	13.1 0.1	5.22 .31	27.7 0.2	59.65 .30	61.2 0.3
Oct. 6.7	58.77 .32	49.2 0.3	17.14 .44	6.6 0.0	45.71 .41	13.5 0.7	5.53 .31	27.4 0.3	59.96 .30	60.8 0.5
16.7	59.08 .31	48.9 0.4	17.58 .43	6.7 0.2	46.11 .40	14 6 1.4	5.84 .31	26.9 0.4	60.26 .30	60.3 0.6
26.7	59.39 .30	48.5 0.4	18.01 .42	7.0 0.4	46.50 .38	16.2 2.0	6.15 .30	26.5 0.5	60.57 .30	59.7 0.7
Nov. 5.6	59.69 .29	48.1 0.4	18.42 .40	7.5 0.6	46.86 .35	18.5 2.5	6.44 .29	25.9 0.5	60.86 .29	59.0 0.7
15.6	59.98 .27	47.6 0.4	18.80 .37	8.2 0.8	47.18 .30	21.2 2.9	6.72 .27	25.4 0.5	61.14 .27	58.2 0.8
25.6	60.23 .24	47.2 0.4	19.15 .33	9.2 1.0	47.46 .25	24.3 3.2	6.98 .25	24.8 0.5	61.40 .25	57.4 0.8
Dec. 5.6	60.46 .21	46.9 0.3	19.46 .28	10.3 1.2	47.68 .19	27.8 3.5	7.22 .22	24.3 0.5	61.63 .22	56.6 0.7
15.5	60.66 .17	46.6 0.2	19.72 .22	11.6 1.4	47.84 .12	31.4 3.6	7.41 .18	23.9 0.4	61.83 .18	55.9 0.7
25.5	60.80 .13	46.4 0.1	19.91 .16	13.0 1.5	47.93 .05	35.0 3.6	7.56 .13	23.5 0.3	61.99 .14	55 3 0.6
35.5	60.91 .08	46.3 0.0	20.04 .10	14.6 1.5	47.95 .02	38.6 3.5	7.67 .08	23.2 0.2	62.10 .09	54.8 0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Geminorum.		ψ⁶ Aurigæ.		α Canis Majoris. (*Sirius.*)		θ Geminorum.		ζ Mensæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 6 37	° ′ +25 13	h m 6 39	° ′ +43 40	h m 6 40	° ′ −16 34	h m 6 46	° ′ +34 4	h m 6 48	° ′ −80 42
	s	″	s	″	s	″	s	″	s	″
Jan. 0.5	49.59 .13	44.4 0.0	35.37 .15	32.9 1.1	46.78 .09	47.6 2.4	14.95 .14	49.8 0.6	29.26 .12	32.6 3.7
10.5	49.69 .07	44.4 0.1	35.48 .08	34.1 1.2	46.85 .04	50.0 2.3	15.06 .09	50.4 0.6	28.97 .41	36.3 3.6
20.5	49.73 .02	44.6 0.2	35.53 .01	35.3 1.2	46.86 .01	52.2 2.1	15.12 .03	51.0 0.7	28.43 .67	39.8 3.4
30.4	49.72 .03	44.8 0.2	35.51 .05	36.6 1.2	46.83 .06	54.2 1.9	15.11 .03	51.8 0.7	27.65 .88	43.0 3.1
Feb. 9.4	49.66 .08	45.1 0.3	35.43 .11	37.8 1.1	46.75 .10	56.0 1.6	15.05 .08	52.5 0.7	26.67 1.08	45.9 2.7
19.4	49.55 .12	45.3 0.3	35.29 .16	38.8 0.9	46.63 .13	57.5 1.3	14.94 .13	53.2 0.6	25.50 1.24	48.5 2.3
Mar. 1.3	49.41 .16	45.6 0.2	35.11 .20	39.6 0.7	46.48 .16	58.6 1.0	14.79 .17	53.8 0.5	24.18 1.37	50.5 1.8
11.3	49.24 .18	45.8 0.2	34.89 .23	40.3 0.5	46.30 .18	59.4 0.7	14.61 .19	54.3 0.4	22.76 1.45	52.2 1.3
21.3	49.05 .19	45.9 0.1	34.65 .24	40.7 0.3	46.11 .20	59.9 0.3	14.40 .21	54.6 0.2	21.27 1.51	53.2 0.8
31.3	48.86 .19	46.0 0.0	34.40 .24	40.8 0.0	45.91 .19	60.1 0.0	14.19 .21	54.7 0.0	19.75 1.53	53.8 0.3
Apr. 10.2	48.67 .18	46.0 0.1	34.17 .23	40.6 0.3	45.72 .18	59.9 0.3	13.99 .20	54.6 0.1	18.24 1.49	53.9 0.2
20.2	48.50 .16	45.8 0.1	33.95 .20	40.2 0.5	45.54 .17	59.5 0.6	13.80 .18	54.4 0.3	16.77 1.43	53.4 0.7
30.2	48.36 .13	45.7 0.2	33.76 .17	39.6 0.8	45.39 .14	58.7 0.9	13.64 .15	54.1 0.4	15.38 1.34	52.4 1.1
May 10.1	48.25 .09	45.4 0.3	33.61 .12	38.7 1.0	45.26 .11	57.7 1.2	13.51 .11	53.6 0.6	14.09 1.22	51.0 1.6
20.1	48.18 .05	45.2 0.3	33.51 .07	37.6 1.1	45.17 .07	56.4 1.4	13.42 .07	52.9 0.7	12.95 1.06	49.1 2.0
30.1	48.15 .00	44.9 0.3	33.46 .02	36.4 1.2	45.12 .04	54.8 1.6	13.38 .02	52.2 0.7	11.97 .88	46.9 2.4
June 9.1	48.17 .04	44.6 0.3	33.47 .03	35.2 1.3	45.10 .00	53.1 1.8	13.39 .03	51.4 0.8	11.17 .69	44.3 2.7
19.0	48.22 .08	44.3 0.3	33.53 .09	33.9 1.3	45.13 .04	51.3 1.9	13.44 .07	50.7 0.8	10.58 .48	41.4 3.0
29.0	48.32 .12	44.0 0.3	33.64 .14	32.5 1.3	45.19 .08	49.3 2.0	13.53 .12	49.8 0.8	10.22 .25	38.3 3.1
July 9.0	48.46 .16	43.7 0.2	33.80 .18	31.2 1.3	45.29 .12	47.3 2.0	13.67 .16	49.0 0.8	10.08 .03	35.2 3.2
19.0	48.64 .19	43.5 0.2	34.01 .22	29.9 1.3	45.42 .15	45.4 1.9	13.85 .20	48.3 0.8	10.18 .21	32.0 3.1
28.9	48.84 .22	43.3 0.2	34.26 .26	28.7 1.2	45.59 .18	43.5 1.8	14.06 .23	47.5 0.7	10.51 .44	29.0 3.0
Aug. 7.9	49.07 .25	43.1 0.2	34.54 .30	27.6 1.1	45.78 .21	41.7 1.6	14.31 .26	46.8 0.7	11.06 .66	26.1 2.8
17.9	49.33 .27	42.8 0.2	34.85 .33	26.6 1.0	46.00 .23	40.2 1.4	14.58 .28	46.1 0.6	11.82 .86	23.5 2.4
27.9	49.61 .29	42.6 0.3	35.19 .35	25.7 0.9	46.24 .25	39.0 1.1	14.88 .30	45.5 0.6	12.77 1.03	21.2 2.0
Sept. 6.8	49.90 .30	42.3 0.3	35.55 .37	24.8 0.7	46.50 .27	38.2 0.7	15.19 .32	44.9 0.6	13.88 1.17	19.4 1.5
16.8	50.21 .31	42.0 0.4	35.93 .39	24.2 0.6	46.77 .28	37.7 0.2	15.52 .34	44.3 0.5	15.12 1.28	18.2 0.9
26.8	50.53 .32	41.6 0.4	36.32 .40	23.6 0.5	47.06 .29	37.6 0.2	15.86 .35	43.8 0.5	16.44 1.34	17.6 0.3
Oct. 6.7	50.85 .32	41.2 0.4	36.72 .40	23.2 0.3	47.34 .29	38.0 0.6	16.22 .35	43.2 0.5	17.81 1.36	17.6 0.3
16.7	51.18 .32	40.7 0.5	37.12 .40	22.9 0.2	47.64 .29	38.9 1.0	16.57 .35	42.8 0.4	19.17 1.33	18.2 1.0
26.7	51.50 .32	40.3 0.5	37.52 .39	22.8 0.0	47.93 .28	40.2 1.4	16.92 .35	42.4 0.3	20.48 1.26	19.5 1.6
Nov. 5.7	51.81 .31	39.8 0.5	37.90 .38	22.9 0.2	48.21 .27	41.8 1.8	17.27 .34	42.2 0.2	21.68 1.14	21.4 2.2
15.6	52.12 .29	39.3 0.4	38.27 .36	23.2 0.4	48.47 .25	43.8 2.1	17.60 .32	42.0 0.1	22.74 .97	23.8 2.7
25.6	52.40 .27	38.9 0.4	38.62 .33	23.6 0.6	48.71 .23	46.1 2.3	17.91 .30	42.0 0.0	23.61 .77	26.7 3.1
Dec. 5.6	52.65 .24	38.6 0.3	38.92 .29	24.3 0.8	48.93 .20	48.5 2.5	18.19 .27	42.1 0.2	24.26 .53	30.0 3.4
15.6	52.86 .20	38.4 0.2	39.18 .24	25.1 0.9	49.11 .16	51.0 2.5	18.44 .22	42.3 0.3	24.67 .28	33.5 3.6
25.5	53.04 .16	38.3 0.1	39.40 .18	26.2 1.1	49.25 .12	53.6 2.5	18.63 .17	42.7 0.4	24.82 .01	37.2 3.7
35.5	53.16 .11	38.3 0.0	39.54 .12	27.3 1.2	49.34 .07	56.1 2.4	18.78 .12	43.2 0.6	24.70 .25	40.8 3.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.		ε Canis Majoris.		ζ Geminorum.		δ Canis Majoris.		63 Aurigæ.		γ^2 Volantis.	
		Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
		h m 6 54	° ′ −28 50	h m 6 58	° ′ +20 42	h m 7 4	° ′ −26 13	h m 7 4	° ′ +39 28	h m 7 9	° ′ −70 20
		s	″	s	″	s	″	s	″	s	″
Jan.	0.5	44.13 .09	13.5 3.0	13.39 .15	55.6 0.3	21.86 .11	67.8 3.0	49.88 .17	55.0 0.8	39.71 .06	13.3 3.9
	10.5	44.20 .04	16.5 2.9	13.50 .09	55.4 0.2	21.94 .06	70.8 2.8	50.02 .11	55.8 0.9	39.70 .07	17.1 3.8
	20.5	44.22 .01	19.3 2.7	13.57 .04	55.2 0.1	21.97 .00	73.5 2.6	50.10 .05	56.8 1.0	39.56 .20	20.8 3.6
	30.4	44.18 .06	21.8 2.4	13.58 .01	55.2 0.0	21.95 .05	76.0 2.4	50.11 .01	57.9 1.0	39.30 .32	24.3 3.4
Feb.	9.4	44.09 .11	24.1 2.1	13.53 .06	55.2 0.1	21.88 .10	78.2 2.1	50.06 .07	58.9 1.0	38.92 .42	27.4 3.0
	19.4	43.96 .15	26.0 1.7	13.45 .11	55.4 0.1	21.76 .14	80.2 1.7	49.96 .13	59.9 0.9	38.45 .51	30.3 2.6
Mar.	1.4	43.79 .18	27.6 1.3	13.32 .15	55.5 0.2	21.60 .17	81.7 1.4	49.81 .17	60.8 0.8	37.90 .59	32.6 2.2
	11.3	43.59 .20	28.7 0.9	13.16 .17	55.7 0.2	21.42 .19	82.9 1.0	49.62 .20	61.5 0.6	37.28 .64	34.6 1.7
	21.3	43.38 .22	29 4 0.5	12.99 .18	55.8 0.2	21.22 .21	83.6 0.6	49.41 .22	62.1 0.4	36.62 .67	36.0 1.1
	31.3	43.16 .22	29.7 0.1	12.80 .18	56.0 0.1	21.01 .21	84.0 0.2	49.18 .23	62.4 0.2	35.94 .69	36.8 0.6
Apr.	10.2	42.94 .21	29.6 0.3	12.62 .17	56.0 0.1	20.80 .20	84.0 0.2	48.96 .22	62.5 0.0	35.25 .68	37.1 0.0
	20.2	42.74 .20	29.2 0.7	12.46 .16	56.1 0.0	20.60 .19	83.6 0.6	48.75 .20	62.3 0.2	34.58 .66	36.9 0.5
	30.2	42.55 .17	28.3 1.0	12.31 .13	56.1 0.0	20.42 .17	82.8 0.9	48.56 .17	61.9 0.4	33.94 .62	36.2 1.0
May	10.2	42.39 .14	27.0 1.4	12.19 .10	56.0 0.0	20.26 .14	81.7 1.3	48.41 .13	61.4 0.6	33.35 .56	35.0 1.5
	20.1	42.27 .10	25.5 1.7	12.11 .06	56.0 0.1	20.14 .11	80.3 1.6	48.30 .09	60.6 0.8	32.82 .49	33.2 1.9
	30.1	42.19 .07	23.6 2.0	12.07 .02	55.9 0.1	20.05 .07	78.6 1.9	48.23 .04	59.7 1.0	32.37 .41	31.1 2.3
June	9.1	42.14 .03	21.5 2.2	12.06 .02	55.9 0.1	20.00 .03	76.6 2.1	48.21 .01	58.7 1.1	32.00 .32	28.6 2.6
	19.1	42.14 .01	19.2 2.4	12.10 .06	55.8 0.1	20.00 .01	74.4 2.2	48.24 .05	57.6 1.1	31.73 .22	25.8 2.9
	29.0	42.17 .06	16.8 2.5	12.18 .09	55.8 0.1	20.02 .05	72.1 2.3	48.32 .10	56.5 1.2	31.57 .11	22.8 3.1
July	9.0	42.25 .10	14.3 2.5	12.29 .13	55.7 0.1	20.10 .09	69.7 2.4	48.44 .15	55.3 1.2	31.50 .01	19.6 3.2
	19.0	42.36 .13	11.8 2.5	12.44 .16	55.7 0.1	20.20 .12	67.4 2.3	48.61 .19	54.1 1.1	31.55 .10	16.4 3.2
	29.0	42.52 .17	9.4 2.3	12.62 .19	55.6 0.1	20.34 .16	65.1 2.2	48.82 .22	53.0 1.1	31.71 .21	13.2 3.1
Aug.	7.9	42.70 .20	7.2 2.1	12.82 .22	55.5 0.1	20.52 .19	62.9 2.0	49.06 .26	51.9 1.1	31.97 .31	10.2 2.9
	17.9	42.91 .23	5.2 1.8	13.06 .24	55.4 0.2	20.72 .22	61.0 1.7	49.33 .29	50.8 1.0	32.33 .41	7.4 2.6
	27.9	43.16 .26	3.5 1.4	13.31 .26	55.2 0.2	20.96 .24	59.4 1.4	49.63 .31	49.8 1.0	32.79 .49	5.0 2.2
Sept.	6.8	43.42 .28	2.3 1.0	13.58 .28	54.9 0.3	21.21 .26	58.2 1.0	49.95 .33	48.9 0.9	33.32 .57	3.0 1.7
	16.8	43.70 .29	1.5 0.5	13.87 .29	54.5 0.4	21.49 .28	57.4 0.5	50.29 .35	48.0 0.8	33.92 .63	1.5 1.2
	26.8	44.00 .30	1.2 0.0	14.18 .31	54.1 0.5	21.78 .30	57.1 0.0	50.65 .36	47.2 0.7	34.57 .67	0.7 0.6
Oct.	6.8	44.31 .31	1.5 0.5	14.49 .32	53.5 0.6	22.08 .31	57.3 0.5	51.02 .37	46.5 0.6	35.26 .69	0.4 0.1
	16.7	44.62 .31	2.2 1.0	14.80 .32	52.9 0.7	22.39 .31	58.0 1.0	51.40 .38	45.9 0.5	35.95 .69	0.9 0.8
	26.7	44.94 .30	3.5 1.5	15.12 .31	52.2 0.7	22.70 .30	59.3 1.5	51.78 .37	45.4 0.4	36.63 .67	2.0 1.4
Nov.	5.7	45.24 .29	5.3 2.0	15.43 .30	51.4 0.8	23.00 .29	61.0 1.9	52.16 .37	45.1 0.2	37.28 .63	3.7 2.0
	15.7	45.52 .27	7.5 2.4	15.73 .29	50.6 0.8	23.29 .28	63.1 2.3	52.52 .36	45.0 0.1	37.88 .56	6.0 2.6
	25.6	45.78 .25	10.1 2.7	16.02 .27	49.9 0.7	23.56 .25	65.6 2.6	52.87 .33	45.0 0.1	38.40 .48	8.8 3.0
Dec.	5.6	46.02 .21	12.9 2.9	16.28 .24	49.2 0.6	23.80 .22	68.3 2.8	53.18 .30	45.2 0.3	38.82 .37	12.1 3.4
	15.6	46.21 .17	15.9 3.0	16.51 .21	48.6 0.5	24.00 .18	71.2 2.9	53.46 .25	45.6 0.5	39.14 .25	15.6 3.6
	25.5	46.36 .12	19.0 3.0	16.70 .17	48.2 0.4	24.16 .14	74.2 2.9	53.69 .20	46.3 0.7	39.34 .13	19.4 3.8
	35.5	46.46 .07	22.0 2.9	16.84 .13	47.8 0.3	24.27 .09	77.1 2.9	53.86 .15	47.1 0.9	39.40 .01	23.2 3.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.		25 Camelopardalis.		δ Geminorum.		Piazzi vii, 67.		β Canis Minoris.		α² Geminorum. (*Castor.*)	
		Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
		h m 7 10	° ′ +82 35	h m 7 14	° ′ +22 9	h m 7 20	° ′ +68 39	h m 7 21	° ′ + 8 29	h m 7 28	° ′ +32 6
		s	″	s	″	s	″	s	″	s	″
Jan.	0.5	18.36 .66	68.9 2.9	11.79 .16	52.8 0.3	34.49 .32	63.6 2.3	46.18 .14	20.8 1.0	16.10 .19	21.0 0.3
	10.5	18.83 .30	71.8 3.0	11.92 .11	52.6 0.2	34.74 .19	66.0 2.4	46.31 .10	19.7 1.0	16.26 .13	21.3 0.4
	20.5	18.95 .05	74.8 3.0	12.00 .05	52.5 0.0	34.87 .06	68.5 2.5	46.39 .05	18.8 0.9	16.36 .07	21.8 0.6
	30.5	18.73 .38	77.8 2.8	12.03 .00	52.5 0.1	34.87 .06	71.0 2.4	46.42 .00	18.0 0.7	16.40 .01	22.4 0.7
Feb.	9.4	18.17 .71	80.6 2.6	12.00 .05	52.7 0.2	34.74 .18	73.4 2.3	46.39 .05	17.4 0.5	16.38 .04	23.1 0.7
	19.4	17.31 .99	83.0 2.3	11.93 .09	52.9 0.2	34.50 .29	75.6 2.1	46.33 .09	16.9 0.4	16.31 .09	23.9 0.7
Mar.	1.4	16.18 1.23	85.1 1.9	11.81 .13	53.2 0.3	34.16 .38	77.5 1.7	46.22 .12	16.6 0.2	16.20 .14	24.6 0.7
	11.3	14.85 1.42	86.7 1.4	11.66 .16	53.4 0.3	33.73 .45	79.1 1.3	46.08 .15	16.4 0.1	16.04 .17	25.2 0.6
	21.3	13.37 1.53	87.8 0.8	11.49 .18	53.7 0.2	33.25 .50	80.2 0.9	45.92 .16	16.4 0.0	15.86 .19	25.8 0.5
	31.3	11.80 1.58	88.4 0.2	11.31 .18	53.9 0.2	32.73 .52	80.8 0.4	45.75 .17	16.4 0.1	15.66 .20	26.2 0.3
Apr.	10.3	10.22 1.57	88.3 0.3	11.13 .17	54.0 0.1	32.21 .51	81.0 0.1	45.58 .17	16.5 0.2	15.46 .21	26.4 0.2
	20.2	8.69 1.48	87.7 0.9	10.95 .16	54.1 0.1	31.70 .49	80.6 0.6	45.42 .16	16.7 0.2	15.27 .18	26.5 0.0
	30.2	7.27 1.35	86.5 1.4	10.80 .14	54.1 0.0	31.23 .44	79.8 1.0	45.27 .14	17.0 0.3	15.09 .16	26.4 0.2
May	10.2	6.01 1.16	84.8 1.9	10.67 .11	54.1 0.0	30.82 .38	78.6 1.4	45.15 .11	17.3 0.4	14.94 .13	26.2 0.3
	20.2	4.96 .93	82.7 2.3	10.58 .08	54.0 0.1	30.48 .30	77.0 1.8	45.06 .08	17.7 0.4	14.83 .10	25.8 0.4
	30.1	4.15 .68	80.3 2.6	10.52 .04	53.9 0.1	30.23 .20	75.0 2.1	45.00 .04	18.2 0.5	14.75 .06	25.3 0.5
June	9.1	3.61 .41	77.5 2.8	10.50 .00	53.8 0.1	30.07 .11	72.8 2.3	44.97 .00	18.7 0.5	14.72 .01	24.7 0.6
	19.1	3.35 .12	74.6 3.0	10.53 .04	53.6 0.1	30.01 .01	70.3 2.5	44.98 .03	19.3 0.6	14.73 .03	24.0 0.7
	29.0	3.37 .17	71.5 3.1	10.59 .08	53.5 0.2	30.06 .09	67.7 2.6	45.03 .06	19.9 0.6	14.78 .07	23.3 0.8
July	9.0	3.68 .45	68.3 3.1	10.69 .11	53.3 0.2	30.20 .19	65.1 2.7	45.11 .10	20.5 0.6	14.86 .11	22.5 0.8
	19.0	4.27 .72	65.2 3.0	10.82 .15	53.1 0.2	30.43 .28	62.4 2.6	45.23 .13	21.1 0.5	14.99 .15	21.7 0.8
	29.0	5.11 .97	62.2 2.9	10.99 .18	52.9 0.2	30.76 .37	59.8 2.5	45.37 .16	21.6 0.5	15.16 .18	20.9 0.8
Aug.	7.9	6.21 1.21	59.4 2.7	11.18 .21	52.7 0.3	31.16 .45	57.3 2.4	45.55 .19	22.1 0.4	15.35 .21	20.0 0.9
	17.9	7.52 1.42	56.8 2.5	11.40 .23	52.4 0.3	31.65 .52	55.0 2.2	45.74 .21	22.5 0.3	15.58 .24	19.1 0.9
	27.9	9.04 1.60	54.4 2.2	11.65 .25	52.0 0.4	32.20 .58	52.8 2.0	45.97 .23	22.7 0.1	15.84 .27	18.2 0.9
Sept.	6.9	10.72 1.75	52.4 1.9	11.91 .27	51.6 0.4	32.82 .64	50.9 1.8	46.21 .25	22.8 0.0	16.12 .29	17.4 0.9
	16.8	12.54 1.87	50.7 1.5	12.20 .29	51.1 0.5	33.48 .68	49.2 1.5	46.47 .27	22.6 0.2	16.42 .31	16.4 0.9
	26.8	14.46 1.96	49.5 1.0	12.50 .30	50.5 0.6	34.18 .72	47.9 1.2	46.74 .28	22.3 0.5	16.73 .32	15.6 0.9
Oct.	6.8	16.46 2.01	48.6 0.6	12.81 .31	49.8 0.7	34.91 .74	46.9 0.8	47.03 .29	21.7 0.7	17.07 .34	14.7 0.9
	16.7	18.49 2.03	48.3 0.1	13.13 .32	49.1 0.8	35.66 .75	46.2 0.4	47.33 .30	20.9 0.9	17.41 .34	13.8 0.8
	26.7	20.51 2.00	48.4 0.3	13.45 .32	48.3 0.8	36.42 .75	46.0 0.0	47.63 .30	19.9 1.1	17.76 .35	13.0 0.8
Nov.	5.7	22.47 1.92	48.9 0.8	13.77 .31	47.4 0.8	37.16 .73	46.1 0.4	47.93 .30	18.8 1.2	18.12 .35	12.3 0.7
	15.7	24.33 1.79	50.0 1.3	14.08 .30	46.6 0.8	37.88 .70	46.7 0.8	48.23 .29	17.5 1.3	18.46 .34	11.6 0.5
	25.6	26.05 1.62	51.5 1.8	14.38 .29	45.8 0.7	38.55 .64	47.7 1.1	48.51 .27	16.1 1.4	18.79 .32	11.2 0.4
Dec.	5.6	27.57 1.40	53.5 2.2	14.66 .26	45.2 0.6	39.17 .57	49.0 1.5	48.77 .25	14.7 1.4	19.10 .29	10.8 0.2
	15.6	28.84 1.13	55.8 2.5	14.90 .23	44.6 0.5	39.70 .49	50.8 1.8	49.00 .22	13.4 1.3	19.38 .26	10.7 0.0
	25.6	29.84 .84	58.4 2.8	15.11 .19	44.1 0.4	40.14 .39	52.8 2.2	49.20 .18	12.1 1.2	19.62 .22	10.8 0.1
	35.5	30.52 .53	61.3 3.0	15.27 .14	43.8 0.3	40.46 .27	55.1 2.4	49.36 .12	10.9 1.0	19.80 .17	11.0 0.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Canis Minoris. (*Procyon.*)		*β* Geminorum. (*Pollux.*)		*ϕ* Geminorum.		26 Lyncis.		Groombridge 1374.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	7 34	+ 5 28	7 39	+28 15	7 47	+27 1	7 47	+47 49	7 48	+74 10
	s	″	s	″	s	″	s	″	s	″
Jan. 0.6	6.54 .16	45.2 1.4	14.62 .20	55.5 0.1	25.43 .19	20.0 0.0	29.41 .25	15.7 1.2	21.00 .49	55.1 2.4
10.5	6.68 .11	43.8 1.3	14.79 .14	55.6 0.2	25.60 .14	20.0 0.1	29.62 .18	16.9 1.3	21.40 .32	57.6 2.6
20.5	6.76 .06	42.6 1.1	14.90 .08	55.8 0.3	25.72 .09	20.1 0.2	29.76 .10	18.3 1.4	21.64 .15	60.2 2.7
30.5	6.80 .01	41.6 0.9	14.95 .02	56.2 0.4	25.78 .03	20.4 0.4	29.83 .03	19.8 1.6	21.70 .02	63.0 2.7
Feb. 9.4	6.79 .04	40.8 0.8	14.94 .03	56.7 0.5	25.78 .02	20.8 0.5	29.82 .04	21.4 1.6	21.60 .18	65.6 2.6
19.4	6.73 .08	40.1 0.6	14.89 .08	57.2 0.6	25.73 .07	21.4 0.5	29.75 .10	22.9 1.5	21.34 .33	68.2 2.4
Mar. 1.4	6.63 .12	39.6 0.4	14.78 .12	57.8 0.6	25.64 .11	21.9 0.6	29.61 .16	24.4 1.4	20.93 .47	70.5 2.1
11.4	6.50 .14	39.3 0.2	14.64 .16	58.4 0.6	25.51 .15	22.5 0.5	29.43 .21	25.7 1.2	20.41 .57	72.4 1.7
21.3	6.34 .16	39.2 0.1	14.47 .18	58.9 0.5	25.34 .17	23.0 0.5	29.20 .24	26.7 0.9	19.79 .65	73.9 1.3
31.3	6.18 .17	39.1 0.0	14.28 .19	59.3 0.4	25.17 .18	23.4 0.4	28.95 .25	27.5 0.6	19.11 .70	74.9 0.8
Apr. 10.3	6.00 .17	39.2 0.1	14.09 .19	59.6 0.2	24.98 .19	23.8 0.3	28.70 .26	28.0 0.3	18.40 .72	75.4 0.2
20.3	5.84 .16	39.4 0.2	13.91 .18	59.8 0.1	24.80 .18	24.0 0.2	28.44 .25	28.1 0.0	17.69 .70	75.4 0.3
30.2	5.69 .14	39.7 0.3	13.74 .16	59.8 0.0	24.63 .16	24.1 0.1	28.20 .23	27.9 0.3	17.02 .65	74.8 0.8
May 10.2	5.56 .11	40.0 0.4	13.59 .13	59.8 0.1	24.48 .13	24.1 0.1	27.99 .19	27.5 0.6	16.40 .58	73.7 1.3
20.2	5.46 .08	40.5 0.5	13.47 .10	59.6 0.2	24.36 .10	24.0 0.2	27.81 .15	26.7 0.9	15.86 .49	72.2 1.7
30.1	5.39 .05	41.0 0.6	13.39 .06	59.2 0.3	24.28 .07	23.8 0.3	27.68 .10	25.7 1.1	15.42 .38	70.3 2.1
June 9.1	5.35 .02	41.7 0.6	13.35 .02	58.8 0.4	24.23 .03	23.5 0.3	27.60 .05	24.4 1.3	15.10 .26	68.1 2.4
19.1	5.35 .02	42.3 0.7	13.35 .02	58.4 0.5	24.22 .01	23.1 0.4	27.58 .00	23.0 1.5	14.90 .13	65.5 2.6
29.0	5.39 .05	43.0 0.7	13.38 .06	57.9 0.6	24.25 .05	22.6 0.5	27.60 .05	21.4 1.6	14.83 .01	62.8 2.8
July 9.0	5.45 .08	43.8 0.7	13.46 .09	57.3 0.6	24.32 .08	22.1 0.6	27.67 .10	19.8 1.7	14.89 .12	59.9 2.9
19.0	5.55 .11	44.4 0.7	13.57 .13	56.7 0.6	24.43 .12	21.5 0.6	27.79 .15	18.0 1.8	15.08 .25	57.0 2.9
29.0	5.68 .14	45.1 0.6	13.72 .16	56.0 0.6	24.56 .15	20.9 0.6	27.96 .19	16.2 1.8	15.39 .37	54.0 2.9
Aug. 8.0	5.84 .17	45.7 0.5	13.90 .19	55.3 0.7	24.73 .18	20.2 0.7	28.17 .23	14.5 1.8	15.82 .48	51.2 2.8
17.9	6.03 .20	46.1 0.4	14.10 .22	54.6 0.7	24.93 .21	19.5 0.7	28.42 .27	12.7 1.7	16.36 .59	48.4 2.7
27.9	6.23 .22	46.4 0.2	14.34 .25	53.8 0.8	25.16 .24	18.8 0.8	28.72 .31	11.0 1.7	16.99 .68	45.8 2.5
Sept. 6.9	6.46 .24	46.5 0.0	14.60 .27	53.0 0.8	25.41 .26	17.9 0.8	29.04 .34	9.4 1.6	17.72 .77	43.4 2.2
16.8	6.71 .26	46.4 0.2	14.88 .29	52.1 0.9	25.68 .28	17.0 0.9	29.39 .37	7.8 1.5	18.53 .84	41.3 1.9
26.8	6.98 .27	46.1 0.5	15.18 .31	51.2 0.9	25.98 .30	16.1 0.9	29.77 .39	6.4 1.3	19.40 .90	39.5 1.6
Oct. 6.8	7.26 .29	45.5 0.7	15.50 .32	50.3 0.9	26.29 .32	15.1 0.9	30.18 .41	5.2 1.2	20.33 .94	38.1 1.2
16.8	7.55 .30	44.6 1.0	15.83 .33	49.3 0.9	26.61 .33	14.1 1.0	30.60 .42	4.1 1.0	21.29 .97	37.1 0.8
26.7	7.85 .30	43.5 1.2	16.16 .34	48.4 0.9	26.95 .34	13.1 1.0	31.03 .43	3.2 0.8	22.27 .98	36.4 0.4
Nov. 5.7	8.15 .29	42.3 1.4	16.50 .34	47.5 0.9	27.29 .34	12.1 0.9	31.46 .43	2.6 0.5	23.25 .97	36.3 0.0
15.7	8.45 .29	40.8 1.5	16.84 .33	46.6 0.8	27.63 .33	11.2 0.9	31.90 .42	2.2 0.2	24.21 .94	36.6 0.5
25.7	8.73 .27	39.3 1.6	17.17 .31	45.9 0.7	27.95 .32	10.4 0.7	32.31 .40	2.1 0.1	25.12 .89	37.3 1.0
Dec. 5.6	9.00 .25	37.7 1.6	17.47 .29	45.4 0.5	28.26 .30	9.7 0.6	32.70 .37	2.4 0.4	25.97 .81	38.5 1.4
15.6	9.24 .22	36.1 1.5	17.75 .26	44.9 0.3	28.54 .27	9.1 0.4	33.06 .33	2.9 0.7	26.72 .70	40.2 1.8
25.6	9.44 .18	34.6 1.5	17.99 .22	44.7 0.1	28.79 .22	8.8 0.2	33.36 .28	3.7 1.0	27.35 .57	42.2 2.2
35.5	9.60 .14	33.2 1.4	18.18 .18	44.7 0.1	28.99 .17	8.6 0.0	33.61 .22	4.8 1.2	27.84 .43	44.6 2.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ω¹ Cancri.		3 Ursæ Majoris (H.)		15 Argûs (ρ).		ζ¹ Cancri.		β Cancri.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 7 54	° ′ +25 39	h m 8 2	° ′ +68 45	h m 8 3	° ′ −24 0	h m 8 6	° ′ +17 56	h m 8 11	° ′ + 9 29
	s	″	s	″	s	″	s	″	s	″
Jan. 0.6	55.55 .21	50.5 0.2	57.32 .43	54.1 2.1	19.42 .17	60.8 2.9	31.18 .21	49.0 0.8	7.96 .20	29.5 1.3
10.5	55.72 .15	50.3 0.1	57.68 .30	56.3 2.3	19.57 .12	63.7 2.9	31.36 .16	48.3 0.6	8.13 .15	28.3 1.1
20.5	55.85 .10	50.4 0.1	57.92 .17	58.7 2.5	19.67 .07	66.6 2.7	31.48 .10	47.8 0.4	8.26 .10	27.3 0.9
30.5	55.92 .04	50.6 0.3	58.02 .04	61.2 2.5	19.71 .02	69.2 2.5	31.56 .05	47.5 0.2	8.33 .05	26.4 0.7
Feb. 9.5	55.93 .01	50.9 0.4	58.00 .08	63.8 2.4	19.70 .03	71.7 2.3	31.58 .00	47.4 0.0	8.36 .00	25.8 0.5
19.4	55.89 .06	51.4 0.5	57.86 .20	66.2 2.3	19.64 .08	73.8 2.0	31.56 .05	47.4 0.1	8.33 .05	25.4 0.3
Mar. 1.4	55.80 .11	51.9 0.5	57.60 .31	68.5 2.1	19.54 .12	75.6 1.7	31.48 .09	47.6 0.2	8.26 .09	25.1 0.2
11.4	55.67 .14	52.4 0.5	57.24 .39	70.4 1.8	19.40 .15	77.2 1.3	31.37 .13	47.8 0.3	8.16 .12	25.0 0.1
21.3	55.52 .16	52.9 0.5	56.81 .46	72.0 1.4	19.23 .17	78.3 0.9	31.23 .15	48.1 0.3	8.02 .14	25.0 0.0
31.3	55.35 .18	53.4 0.4	56.32 .50	73.2 0.9	19.05 .19	79.1 0.6	31.07 .16	48.4 0.3	7.87 .16	25.1 0.1
Apr. 10.3	55.16 .18	53.8 0.3	55.81 .52	73.9 0.4	18.86 .19	79.5 0.2	30.90 .17	48.7 0.3	7.71 .16	25.3 0.2
20.3	54.98 .17	54.0 0.2	55.29 .51	74.1 0.0	18.67 .18	79.5 0.1	30.74 .16	49.0 0.3	7.55 .15	25.5 0.3
30.2	54.82 .15	54.2 0.1	54.79 .48	73.8 0.5	18.48 .17	79.2 0.5	30.58 .15	49.3 0.2	7.40 .14	25.8 0.3
May 10.2	54.67 .13	54.2 0.0	54.32 .44	73.0 1.0	18.32 .15	78.5 0.8	30.44 .13	49.5 0.2	7.26 .12	26.2 0.4
20.2	54.55 .10	54.2 0.1	53.92 .37	71.8 1.4	18.18 .13	77.5 1.1	30.32 .10	49.7 0.1	7.15 .10	26.6 0.4
30.2	54.46 .07	54.0 0.2	53.59 .29	70.2 1.8	18.06 .10	76.2 1.4	30.23 .07	49.9 0.1	7.06 .07	27.0 0.4
June 9.1	54.41 .03	53.8 0.3	53.34 .21	68.2 2.1	17.98 .07	74.7 1.7	30.18 .04	50.0 0.1	7.00 .04	27.5 0.4
19.1	54.40 .00	53.5 0.3	53.18 .11	66.0 2.4	17.93 .03	72.9 1.9	30.15 .01	50.0 0.0	6.97 .01	27.9 0.4
29.1	54.42 .04	53.1 0.4	53.11 .02	63.5 2.6	17.91 .00	71.0 2.0	30.17 .03	50.1 0.0	6.98 .02	28.4 0.4
July 9.0	54.48 .08	52.6 0.5	53.14 .07	60.8 2.7	17.92 .03	68.9 2.1	30.21 .06	50.0 0.0	7.02 .05	28.8 0.4
19.0	54.57 .11	52.1 0.5	53.26 .17	58.1 2.8	17.98 .07	66.8 2.1	30.29 .09	50.0 0.1	7.09 .08	29.2 0.4
29.0	54.70 .14	51.6 0.6	53.48 .26	55.3 2.8	18.06 .10	64.6 2.1	30.40 .12	49.8 0.2	7.19 .11	29.6 0.3
Aug. 8.0	54.86 .17	51.0 0.6	53.78 .34	52.5 2.7	18.18 .13	62.6 2.0	30.54 .15	49.6 0.3	7.31 .14	29.9 0.2
17.9	55.05 .20	50.3 0.7	54.16 .42	49.8 2.6	18.33 .17	60.7 1.8	30.71 .18	49.3 0.4	7.47 .17	30.0 0.1
27.9	55.27 .23	49.6 0.7	54.62 .49	47.2 2.5	18.51 .20	59.1 1.5	30.90 .21	48.9 0.5	7.65 .20	30.1 0.1
Sept. 6.9	55.51 .25	48.8 0.8	55.15 .56	44.8 2.3	18.72 .22	57.8 1.2	31.12 .23	48.4 0.6	7.86 .22	29.9 0.3
16.9	55.77 .27	47.9 0.9	55.74 .62	42.6 2.0	18.96 .25	56.8 0.8	31.37 .25	47.7 0.7	8.09 .24	29.6 0.5
26.8	56.06 .29	46.9 1.0	56.39 .67	40.7 1.8	19.22 .27	56.3 0.3	31.63 .27	46.9 0.9	8.34 .26	29.0 0.7
Oct. 6.8	56.37 .31	45.9 1.0	57.08 .71	39.0 1.5	19.50 .29	56.2 0.2	31.94 .29	46.0 1.0	8.62 .28	28.3 0.9
16.8	56.69 .33	44.8 1.1	57.80 .74	37.7 1.1	19.80 .30	56.7 0.7	32.22 .31	44.9 1.1	8.91 .30	27.3 1.1
26.7	57.02 .33	43.8 1.1	58.55 .75	36.8 0.7	20.12 .30	57.6 1.2	32.54 .32	43.7 1.2	9.21 .31	26.1 1.2
Nov. 5.7	57.36 .34	42.7 1.0	59.30 .75	36.4 0.3	20.43 .31	59.0 1.6	32.86 .32	42.5 1.2	9.52 .31	24.8 1.4
15.7	57.69 .33	41.7 1.0	60.05 .73	36.3 0.1	20.75 .31	60.9 2.0	33.18 .32	41.2 1.3	9.83 .31	23.4 1.5
25.7	58.02 .32	40.7 0.9	60.77 .70	36.7 0.6	21.05 .29	63.1 2.4	33.50 .31	40.0 1.2	10.14 .30	21.8 1.5
Dec. 5.6	58.33 .30	39.9 0.7	61.45 .65	37.6 1.1	21.33 .27	65.6 2.6	33.80 .29	38.8 1.1	10.43 .28	20.3 1.5
15.6	58.61 .27	39.3 0.6	62.06 .57	38.8 1.5	21.59 .24	68.4 2.8	34.07 .26	37.7 1.0	10.70 .26	18.8 1.4
25.6	58.86 .23	38.8 0.4	62.59 .48	40.5 1.9	21.81 .20	71.3 2.9	34.32 .23	36.7 0.9	10.94 .22	17.4 1.3
35.6	59.07 .19	38.6 0.2	63.01 .38	42.6 2.2	21.98 .15	74.2 2.9	34.53 .19	35.9 0.7	11.14 .18	16.1 1.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	30 Monocerotis.		θ Chamæleontis.		η Cancri.		σ Hydræ.		γ Cancri.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 8 20	° ′ −3 34	h m 8 23	° ′ −77 9	h m 8 26	° ′ +20 46	h m 8 33	° ′ + 3 41	h m 8 37	° ′ +21 49
	s	″	s	″	s	″	s	″	s	″
Jan. 0.6	42.16 .20	55.0 1.9	43.90 .36	40.3 3.6	58.11 .23	40.8 0.7	34.18 .22	25.4 1.7	32.49 .24	30.4 0.8
10.6	42.33 .15	57.0 1.9	44.17 .17	44.1 3.8	58.31 .18	40.2 0.5	34.36 .17	23.8 1.5	32.70 .19	29.8 0.5
20.5	42.46 .10	58.8 1.7	44.25 .02	48.0 3.9	58.46 .13	39.9 0.3	34.51 .12	22.3 1.3	32.86 .14	29.5 0.2
30.5	42.53 .05	60.4 1.5	44.14 .20	51.9 3.8	58.58 .07	39.7 0.1	34.60 .07	21.1 1.1	32.97 .08	29.4 0.0
Feb. 9.5	42.56 .00	61.8 1.3	43.85 .37	55.6 3.6	58.61 .02	39.8 0.1	34.65 .02	20.1 0.9	33.03 .03	29.5 0.2
19.4	42.54 .04	63.0 1.1	43.39 .53	59.2 3.4	58.60 .03	40.0 0.3	34.64 .03	19.3 0.7	33.03 .02	29.8 0.3
Mar. 1.4	42.47 .08	64.0 0.8	42.78 .67	62.4 3.1	58.54 .08	40.3 0.4	34.59 .07	18.7 0.5	32.98 .07	30.1 0.4
11.4	42.37 .11	64.7 0.6	42.05 .79	65.3 2.7	58.45 .11	40.7 0.4	34.50 .10	18.3 0.3	32.89 .11	30.6 0.5
21.4	42.24 .14	65.2 0.4	41.21 .88	67.8 2.2	58.31 .14	41.2 0.5	34.39 .13	18.1 0.1	32.77 .14	31.2 0.5
31.3	42.10 .15	65.5 0.2	40.29 .95	69.8 1.7	58.16 .16	41.6 0.5	34.24 .15	18.0 0.0	32.62 .16	31.7 0.5
Apr. 10.3	41.94 .16	65.6 0.0	39.31 .99	71.3 1.2	58.00 .17	42.1 0.4	34.09 .15	18.1 0.2	32.46 .17	32.2 0.5
20.3	41.78 .16	65.4 0.2	38.31 1.01	72.3 0.7	57.83 .17	42.5 0.4	33.94 .16	18.3 0.3	32.29 .16	32.7 0.4
30.3	41.62 .15	65.1 0.4	37.30 1.00	72.8 0.2	57.67 .16	42.8 0.3	33.79 .15	18.6 0.4	32.13 .15	33.1 0.3
May 10.2	41.48 .13	64.7 0.5	36.32 .97	72.7 0.3	57.52 .14	43.1 0.2	33.65 .13	19.0 0.5	31.98 .14	33.4 0.2
20.2	41.36 .11	64.0 0.7	35.38 .91	72.1 0.8	57.39 .11	43.3 0.1	33.52 .11	19.6 0.5	31.85 .12	33.6 0.2
30.2	41.26 .08	63.2 0.8	34.50 .83	71.0 1.3	57.29 .08	43.4 0.1	33.43 .08	20.1 0.6	31.74 .09	33.6 0.1
June 9.2	41.20 .05	62.4 0.9	33.72 .73	69.5 1.8	57.22 .05	43.4 0.0	33.36 .05	20.8 0.7	31.66 .06	33.7 0.0
19.1	41.16 .02	61.4 1.0	33.04 .62	67.4 2.2	57.18 .02	43.4 0.1	33.31 .03	21.5 0.7	31.61 .03	33.6 0.1
29.1	41.15 .01	60.3 1.1	32.48 .49	65.0 2.5	57.17 .01	43.2 0.2	33.30 .00	22.2 0.7	31.60 .00	33.4 0.2
July 9.1	41.17 .04	59.2 1.1	32.07 .34	62.3 2.8	57.20 .04	43.0 0.2	33.32 .03	22.9 0.7	31.62 .03	33.2 0.3
19.0	41.22 .07	58.1 1.1	31.80 .18	59.4 3.0	57.26 .07	42.8 0.3	33.36 .06	23.6 0.7	31.66 .06	32.8 0.4
29.0	41.30 .10	57.0 1.0	31.70 .02	56.3 3.1	57.35 .11	42.4 0.4	33.44 .09	24.2 0.6	31.74 .10	32.4 0.5
Aug. 8.0	41.42 .13	56.0 0.9	31.76 .15	53.2 3.1	57.47 .14	42.0 0.5	33.54 .12	24.8 0.5	31.86 .13	31.9 0.6
18.0	41.56 .15	55.1 0.8	31.99 .31	50.1 3.0	57.62 .17	41.5 0.6	33.67 .14	25.2 0.4	32.00 .16	31.3 0.7
27.9	41.72 .18	54.4 0.6	32.39 .47	47.2 2.8	57.80 .19	40.8 0.7	33.83 .17	25.5 0.2	32.17 .18	30.5 0.8
Sept. 6.9	41.92 .20	54.0 0.3	32.94 .62	44.6 2.4	58.01 .22	40.1 0.8	34.01 .20	25.6 0.0	32.37 .21	29.7 0.9
16.9	42.13 .23	53.8 0.0	33.63 .76	42.3 2.0	58.24 .24	39.2 0.9	34.22 .22	25.4 0.3	32.59 .24	28.7 1.0
26.8	42.37 .25	53.9 0.3	34.45 .87	40.6 1.5	58.50 .27	38.2 1.1	34.46 .25	25.0 0.5	32.84 .26	27.6 1.2
Oct. 6.8	42.64 .27	54.4 0.6	35.37 .96	39.3 0.9	58.78 .29	37.1 1.2	34.72 .27	24.4 0.8	33.12 .29	26.4 1.3
16.8	42.92 .29	55.1 0.9	36.37 1.02	38.7 0.3	59.08 .31	35.8 1.3	34.99 .29	23.4 1.1	33.41 .31	25.1 1.3
26.8	43.21 .30	56.2 1.2	37.40 1.04	38.8 0.4	59.39 .32	34.5 1.3	35.29 .30	22.3 1.3	33.73 .32	23.7 1.4
Nov. 5.7	43.52 .30	57.6 1.5	38.44 1.03	39.5 1.0	59.72 .33	33.2 1.3	35.59 .31	20.9 1.5	34.06 .33	22.3 1.4
15.7	43.82 .30	59.2 1.7	39.45 .97	40.8 1.6	60.05 .33	31.9 1.3	35.90 .31	19.3 1.7	34.39 .33	20.9 1.4
25.7	44.12 .29	61.1 1.9	40.39 .89	42.8 2.2	60.38 .32	30.6 1.2	36.21 .30	17.6 1.8	34.72 .33	19.6 1.3
Dec. 5.7	44.41 .28	63.1 2.0	41.23 .77	45.4 2.7	60.69 .31	29.4 1.1	36.51 .29	15.8 1.8	35.04 .31	18.3 1.2
15.6	44.68 .25	65.1 2.1	41.94 .63	48.4 3.1	60.99 .28	28.3 1.0	36.79 .27	13.9 1.8	35.35 .29	17.2 1.0
25.6	44.92 .22	67.2 2.0	42.49 .47	51.8 3.5	61.26 .25	27.4 0.8	37.04 .24	12.2 1.7	35.63 .26	16.3 0.8
35.6	45.12 .18	69.2 1.9	42.87 .28	55.4 3.7	61.49 .21	26.7 0.6	37.26 .20	10.5 1.6	35.86 .22	15.6 0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Hydræ.		σ¹ Cancri (mean).		ι Ursæ Majoris.		σ² Ursæ Majoris.		κ Cancri.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 8 41	° ′ + 6 46	h m 8 48	° ′ +30 57	h m 8 52	° ′ +48 25	h m 9 1	° ′ +67 31	h m 9 2	° ′ +11 3
	s	″	s	″	s	″	s	″	s	″
Jan. 0.6	31.16 .22	60.1 1.6	11.27 .26	16.5 0.1	24.88 .33	48.2 0.7	40.52 .51	68.0 1.5	22.16 .25	64.3 1.4
10.6	31.36 .18	58.7 1.4	11.51 .21	16.4 0.1	25.17 .26	49.0 1.0	40.99 .42	69.7 1.9	22.38 .20	63.0 1.2
20.5	31.51 .13	57.4 1.2	11.70 .16	16.6 0.3	25.40 .19	50.2 1.3	41.35 .31	71.8 2.2	22.56 .15	62.0 1.0
30.5	31.62 .08	56.3 1.0	11.82 .10	17.0 0.5	25.56 .12	51.6 1.5	41.60 .18	74.1 2.5	22.68 .10	61.1 0.7
Feb. 9.5	31.67 .03	55.5 0.8	11.90 .04	17.6 0.7	25.64 .05	53.2 1.7	41.72 .06	76.6 2.6	22.76 .05	60.5 0.5
19.5	31.67 .02	54.8 0.5	11.91 .01	18.4 0.8	25.65 .02	55.0 1.7	41.72 .06	79.2 2.5	22.79 .00	60.1 0.3
Mar. 1.4	31.63 .06	54.4 0.3	11.87 .06	19.3 0.9	25.59 .09	56.7 1.7	41.60 .17	81.7 2.4	22.76 .04	59.9 0.1
11.4	31.55 .10	54.2 0.2	11.78 .10	20.3 0.9	25.47 .15	58.4 1.6	41.38 .27	84.1 2.3	22.70 .08	59.9 0.0
21.4	31.44 .12	54.1 0.0	11.65 .14	21.2 0.9	25.30 .19	60.0 1.5	41.07 .35	86.2 2.0	22.60 .11	60.0 0.2
31.3	31.30 .14	54.1 0.1	11.50 .16	22.0 0.8	25.09 .22	61.4 1.2	40.68 .41	88.0 1.6	22.48 .13	60.2 0.3
Apr. 10.3	31.15 .15	54.3 0.2	11.32 .18	22.8 0.7	24.85 .24	62.5 0.9	40.24 .46	89.4 1.2	22.34 .15	60.5 0.3
20.3	31.00 .15	54.6 0.3	11.14 .18	23.4 0.5	24.60 .25	63.2 0.6	39.77 .47	90.4 0.7	22.18 .15	60.9 0.4
30.3	30.84 .14	54.9 0.3	10.96 .17	23.9 0.4	24.35 .24	63.7 0.3	39.30 .47	90.8 0.2	22.04 .14	61.3 0.4
May 10.2	30.70 .13	55.3 0.4	10.79 .16	24.2 0.2	24.11 .22	63.8 0.0	38.83 .45	90.8 0.3	21.90 .13	61.8 0.4
20.2	30.58 .11	55.8 0.4	10.64 .14	24.2 0.0	23.90 .20	63.6 0.4	38.39 .42	90.3 0.8	21.77 .12	62.2 0.4
30.2	30.48 .09	56.2 0.5	10.52 .11	24.1 0.2	23.71 .17	63.0 0.7	38.00 .36	89.3 1.2	21.66 .10	62.6 0.4
June 9.2	30.40 .06	56.8 0.5	10.42 .08	23.9 0.4	23.56 .13	62.2 1.0	37.66 .30	87.9 1.6	21.57 .07	63.0 0.4
19.1	30.36 .03	57.4 0.6	10.36 .04	23.4 0.5	23.46 .09	61.0 1.3	37.40 .23	86.0 2.0	21.51 .04	63.4 0.4
29.1	30.34 .00	57.9 0.5	10.33 .01	22.8 0.7	23.39 .04	59.6 1.5	37.20 .15	83.9 2.3	21.48 .01	63.8 0.3
July 9.1	30.35 .03	58.4 0.5	10.34 .02	22.1 0.8	23.37 .01	58.0 1.7	37.09 .07	81.5 2.5	21.48 .02	64.0 0.3
19.0	30.39 .06	59.0 0.4	10.38 .06	21.2 0.9	23.40 .05	56.2 1.9	37.06 .01	78.8 2.7	21.50 .04	64.3 0.2
29.0	30.46 .08	59.4 0.4	10.45 .09	20.3 1.0	23.47 .10	54.2 2.0	37.11 .09	76.0 2.9	21.55 .07	64.5 0.1
Aug. 8.0	30.55 .11	59.8 0.3	10.56 .12	19.2 1.1	23.59 .14	52.2 2.1	37.25 .17	73.1 3.0	21.63 .09	64.5 0.0
18.0	30.68 .14	60.0 0.2	10.70 .16	18.0 1.2	23.75 .18	50.0 2.2	37.46 .25	70.1 3.0	21.74 .11	64.5 0.1
27.9	30.83 .17	60.1 0.0	10.87 .19	16.7 1.3	23.95 .22	47.8 2.2	37.76 .33	67.1 2.9	21.87 .14	64.3 0.2
Sept. 6.9	31.01 .19	60.0 0.2	11.07 .22	15.4 1.4	24.20 .26	45.7 2.2	38.13 .40	64.2 2.8	22.04 .18	63.9 0.4
16.9	31.22 .22	59.7 0.4	11.30 .25	13.9 1.5	24.48 .30	43.5 2.1	38.56 .47	61.4 2.7	22.23 .21	63.3 0.6
26.9	31.45 .24	59.2 0.6	11.56 .27	12.4 1.5	24.80 .34	41.4 2.0	39.07 .53	58.8 2.5	22.45 .23	62.6 0.8
Oct. 6.8	31.70 .26	58.4 0.9	11.85 .30	10.9 1.5	25.16 .37	39.4 1.9	39.64 .58	56.4 2.2	22.70 .26	61.6 1.1
16.8	31.98 .28	57.4 1.1	12.16 .32	9.4 1.5	25.54 .40	37.6 1.8	40.26 .63	54.3 1.9	22.97 .28	60.4 1.3
26.8	32.28 .30	56.1 1.3	12.50 .34	7.9 1.5	25.95 .42	35.9 1.6	40.92 .68	52.5 1.6	23.26 .30	59.0 1.5
Nov. 5.7	32.58 .31	54.7 1.5	12.84 .35	6.4 1.4	26.38 .44	34.5 1.3	41.61 .70	51.2 1.2	23.56 .31	57.5 1.6
15.7	32.90 .31	53.1 1.6	13.20 .36	5.1 1.3	26.82 .44	33.3 1.0	42.32 .71	50.2 0.7	23.88 .32	55.9 1.6
25.7	33.21 .30	51.4 1.7	13.56 .35	3.8 1.1	27.27 .44	32.5 0.7	43.04 .70	49.8 0.2	24.20 .32	54.3 1.7
Dec. 5.7	33.51 .29	49.7 1.7	13.91 .34	2.8 0.9	27.70 .42	32.0 0.3	43.73 .68	49.8 0.3	24.52 .31	52.6 1.7
15.6	33.80 .27	48.0 1.7	14.25 .32	2.1 0.6	28.11 .39	31.9 0.1	44.39 .63	50.3 0.8	24.82 .29	50.9 1.6
25.6	34.06 .24	46.3 1.6	14.55 .28	1.5 0.4	28.48 .35	32.2 0.5	44.99 .56	51.3 1.2	25.10 .26	49.4 1.5
35.6	34.28 .20	44.8 1.5	14.81 .24	1.3 0.1	28.81 .30	32.9 0.8	45.51 .47	52.8 1.7	25.35 .23	48.0 1.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Hydræ.		β Argûs.		ι Argûs.		α Lyncis.		α Hydræ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	9 9	+ 2 43	9 12	−69 18	9 14	−58 51	9 14	+34 48	9 22	− 8 13
	s	″	s	″	s	″	s	″	s	″
Jan. 0.6	11.91 .25	62.0 1.8	9.73 .40	14.2 3.5	27.51 .32	16.3 3.5	60.39 .31	40.6 0.2	42.51 .25	36.3 2.4
10.6	12.14 .20	60.3 1.7	10.08 .29	17.9 3.8	27.79 .24	19.9 3.7	60.67 .25	40.6 0.1	42.73 .21	38.6 2.2
20.6	12.31 .15	58.7 1.5	10.31 .18	21.8 3.9	27.99 .16	23.8 3.9	60.89 .19	40.9 0.4	42.92 .16	40.8 2.1
30.5	12.44 .10	57.3 1.3	10.43 .06	25.7 3.9	28.11 .08	27.6 3.8	61.05 .13	41.5 0.7	43.06 .11	42.9 1.9
Feb. 9.5	12.52 .05	56.1 1.0	10.43 .06	29.6 3.8	28.15 .00	31.4 3.7	61.15 .07	42.3 0.9	43.14 .07	44.7 1.7
19.5	12.55 .00	55.2 0.8	10.32 .17	33.4 3.7	28.10 .08	35.1 3.5	61.20 .01	43.3 1.1	43.18 .02	46.3 1.5
Mar. 1.5	12.53 .04	54.5 0.6	10.09 .27	37.0 3.4	27.98 .15	38.5 3.3	61.18 .04	44.5 1.2	43.17 .03	47.6 1.2
11.4	12.48 .08	54.0 0.4	9.78 .35	40.3 3.1	27.79 .22	41.6 2.9	61.11 .09	45.7 1.2	43.12 .07	48.7 1.0
21.4	12.38 .11	53.8 0.2	9.38 .43	43.2 2.7	27.54 .27	44.4 2.5	61.00 .13	46.9 1.1	43.04 .10	49.5 0.7
31.4	12.26 .13	53.7 0.0	8.92 .49	45.8 2.3	27.25 .31	46.7 2.1	60.86 .16	48.0 1.1	42.92 .12	50.1 0.5
Apr. 10.3	12.13 .14	53.7 0.1	8.41 .53	47.8 1.8	26.93 .34	48.6 1.6	60.69 .18	49.1 0.9	42.79 .14	50.4 0.2
20.3	11.98 .15	53.9 0.2	7.87 .55	49.4 1.3	26.58 .35	50.0 1.1	60.50 .19	49.9 0.7	42.65 .14	50.5 0.0
30.3	11.84 .14	54.2 0.3	7.30 .57	50.4 0.8	26.22 .36	50.9 0.6	60.32 .18	50.6 0.5	42.50 .14	50.4 0.2
May 10.3	11.70 .13	54.6 0.4	6.74 .56	51.0 0.3	25.86 .35	51.2 0.1	60.14 .17	51.0 0.3	42.36 .14	50.1 0.4
20.2	11.58 .12	55.1 0.5	6.18 .54	50.9 0.3	25.51 .34	51.1 0.4	59.97 .16	51.2 0.1	42.23 .12	49.6 0.6
30.2	11.47 .10	55.7 0.6	5.64 .52	50.4 0.8	25.18 .32	50.4 0.9	59.82 .13	51.2 0.2	42.12 .11	48.9 0.7
June 9.2	11.38 .08	56.3 0.6	5.15 .47	49.3 1.3	24.87 .29	49.3 1.4	59.71 .10	50.9 0.4	42.02 .09	48.1 0.9
19.2	11.31 .05	57.0 0.7	4.70 .41	47.8 1.8	24.60 .25	47.7 1.8	59.62 .07	50.4 0.6	41.94 .07	47.1 1.0
29.1	11.27 .02	57.7 0.7	4.32 .35	45.8 2.2	24.38 .20	45.7 2.2	59.56 .04	49.8 0.8	41.88 .04	46.0 1.1
July 9.1	11.26 .00	58.4 0.7	4.01 .27	43.4 2.5	24.20 .15	43.3 2.5	59.53 .01	48.9 1.0	41.86 .02	44.9 1.1
19.1	11.28 .03	59.0 0.6	3.78 .19	40.7 2.8	24.07 .10	40.7 2.7	59.54 .03	47.8 1.1	41.85 .01	43.7 1.2
29.0	11.32 .06	59.6 0.6	3.64 .09	37.8 3.0	24.01 .04	37.8 2.9	59.58 .06	46.6 1.3	41.88 .04	42.5 1.1
Aug. 8.0	11.39 .08	60.2 0.5	3.59 .01	34.7 3.1	24.00 .03	34.9 3.0	59.66 .09	45.3 1.4	41.92 .07	41.4 1.1
18.0	11.48 .11	60.6 0.3	3.65 .11	31.6 3.1	24.07 .10	31.9 2.9	59.77 .13	43.8 1.5	42.00 .09	40.4 1.0
28.0	11.61 .14	60,8 0.1	3.81 .21	28.6 2.9	24.20 .16	29.0 2.8	59.92 .16	42.2 1.6	42.11 .11	39.5 0.8
Sept. 6.9	11.76 .17	60.9 0.1	4.07 .31	25.8 2.7	24.39 .23	26.3 2.5	60.10 .19	40.5 1.7	42.25 .15	38.9 0.5
16.9	11.95 .20	60.7 0.3	4.43 .41	23.2 2.4	24.66 .29	24.0 2.2	60.31 .23	38.8 1.8	42.42 .18	38.5 0.2
26.9	12.16 .22	60.3 0.6	4.88 .49	21.0 1.9	24.98 .35	22.0 1.7	60.55 .26	37.0 1.8	42.62 .21	38.4 0.1
Oct. 6.9	12.39 .25	59.6 0.8	5.42 .57	19.4 1.4	25.37 .41	20.5 1.2	60.83 .29	35.2 1.8	42.85 .24	38.6 0.4
16.8	12.66 .27	58.7 1.1	6.03 .63	18.3 0.8	25.80 .45	19.6 0.6	61.14 .32	33.3 1.8	43.10 .26	39.2 0.8
26.8	12.94 .29	57.4 1.3	6.68 .67	17.8 0.1	26.27 .48	19.3 0.0	61.47 .34	31.5 1.7	43.38 .29	40.2 1.1
Nov. 5.8	13.24 .30	56.0 1.5	7.37 .69	18.0 0.5	26.76 .50	19.7 0.7	61.82 .36	29.8 1.6	43.68 .30	41.5 1.4
15.7	13.55 .31	54.4 1.7	8.07 .69	18.8 1.2	27.27 .50	20.7 1.3	62.19 .37	28.3 1.5	43.99 .31	43.1 1.7
25.7	13.87 .31	52.5 1.9	8.75 .67	20.4 1.8	27.77 .49	22.4 1.9	62.56 .37	26.9 1.2	44.31 .31	45.0 2.0
Dec. 5.7	14.18 .30	50.6 1.9	9.40 .62	22.5 2.4	28.25 .46	24.6 2.5	62.93 .36	25.8 1.0	44.62 .30	47.1 2.2
15.7	14.48 .28	48.7 1.9	9.99 .54	25.2 2.9	28.69 .41	27.3 2.9	63.29 .34	25.0 0.7	44.92 .29	49.3 2.3
25.6	14.75 .26	46.8 1.8	10.49 .46	28.3 3.3	29.08 .36	30.5 3.3	63.62 .31	24.4 0.4	45.20 .26	51.6 2.3
35.6	15.00 .23	44.9 1.7	10.91 .36	31.8 3.6	29.40 .29	34.0 3.6	63.92 .28	24.2 0.1	45.45 .23	54.0 2.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	1 Draconis (H.)		*d* Ursæ Majoris.		θ Ursæ Majoris.		10 Leonis Minoris.		*o* Leonis.	
	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.
	h m 9 22	° ′ +81 45	h m 9 25	° ′ +70 15	h m 9 26	° ′ +52 7	h m 9 28	° ′ +36 49	h m 9 35	° ′ +10 20
	s	″	s	″	s	″	s	″	s	″
Jan. 0.6	60.75 1.31	46.6 1.8	43.44 .64	51.8 1.4	13.29 .39	41.2 0.6	8.43 .33	73.7 0.2	50.97 .28	39.8 1.6
10.6	61.94 1.07	48.7 2.2	44.01 .51	53.4 1.8	13.64 .32	42.0 1.0	8.72 .27	73.7 0.2	51.22 .23	38.4 1.3
20.6	62.87 .80	51.1 2.6	44.46 .39	55.4 2.2	13.93 .25	43.2 1.3	8.96 .21	74.1 0.5	51.42 .18	37.2 1.1
30.5	63.52 .50	53.8 2.8	44.79 .26	57.7 2.5	14.14 .18	44.7 1.6	9.14 .15	74.7 0.8	51.58 .13	36.2 0.9
Feb. 9.5	63.86 .19	56.8 3.0	44.99 .13	60.3 2.6	14.28 .10	46.4 1.8	9.26 .09	75.6 1.0	51.69 .08	35.4 0.6
19.5	63.89 .12	59.8 3.0	45.04 .01	63.0 2.7	14.33 .02	48.4 2.0	9.32 .03	76.8 1.2	51.75 .03	35.0 0.4
Mar. 1.5	63.61 .42	62.8 2.9	44.97 .14	65.7 2.6	14.31 .06	50.4 2.0	9.32 .03	78.1 1.3	51.76 .01	34.7 0.2
11.4	63.05 .69	65.6 2.7	44.77 .26	68.3 2.5	14.22 .12	52.4 1.9	9.26 .08	79.4 1.4	51.73 .05	34.6 0.0
21.4	62.23 .93	68.1 2.3	44.46 .36	70.7 2.2	14.07 .18	54.2 1.8	9.16 .12	80.8 1.3	51.65 .08	34.8 0.2
31.4	61.20 1.13	70.2 1.9	44.05 .44	72.8 1.9	13.87 .22	56.0 1.6	9.02 .15	82.0 1.2	51.55 .11	35.0 0.3
Apr. 10.4	60.00 1.27	71.9 1.4	43.58 .50	74.4 1.5	13.63 .25	57.4 1.3	8.86 .17	83.2 1.1	51.43 .13	35.4 0.4
20.3	58.68 1.35	73.0 0.9	43.06 .54	75.7 1.0	13.37 .26	58.6 1.0	8.68 .19	84.2 0.9	51.30 .14	35.8 0.4
30.3	57.31 1.39	73.6 0.3	42.52 .55	76.4 0.5	13.10 .27	59.4 0.6	8.49 .19	84.9 0.6	51.15 .14	36.2 0.5
May 10.3	55.92 1.37	73.7 0.2	41.98 .54	76.6 0.0	12.83 .26	59.8 0.2	8.30 .18	85.5 0.4	51.02 .13	36.7 0.5
20.2	54.58 1.31	73.1 0.8	41.46 .51	76.4 0.5	12.58 .24	59.8 0.2	8.13 .17	85.7 0.1	50.89 .12	37.2 0.5
30.2	53.32 1.20	72.0 1.3	40.97 .46	75.6 1.0	12.35 .21	59.4 0.5	7.97 .14	85.8 0.1	50.77 .11	37.7 0.5
June 9.2	52.18 1.06	70.5 1.8	40.54 .40	74.3 1.5	12.15 .18	58.7 0.9	7.84 .12	85.5 0.4	50.67 .09	38.2 0.5
19.2	51.21 .89	68.4 2.2	40.18 .33	72.7 1.9	11.99 .14	57.6 1.2	7.74 .09	85.0 0.6	50.59 .07	38.6 0.5
29.1	50.42 .69	66.0 2.6	39.89 .24	70.6 2.2	11.87 .10	56.3 1.5	7.66 .06	84.3 0.8	50.54 .04	39.0 0.4
July 9.1	49.83 .48	63.2 2.9	39.69 .16	68.2 2.5	11.79 .05	54.6 1.8	7.62 .02	83.4 1.0	50.51 .02	39.3 0.3
19.1	49.46 .26	60.1 3.2	39.58 .07	65.6 2.8	11.76 .01	52.7 2.0	7.62 .01	82.2 1.2	50.50 .01	39.6 0.2
29.1	49.31 .03	56.8 3.3	39.56 .02	62.7 3.0	11.78 .04	50.6 2.2	7.64 .04	80.9 1.4	50.52 .03	39.8 0.1
Aug. 8.0	49.39 .19	53.5 3.4	39.62 .11	59.6 3.1	11.85 .09	48.3 2.4	7.71 .08	79.4 1.5	50.57 .06	39.8 0.0
18.0	49.70 .42	50.0 3.5	39.78 .20	56.5 3.2	11.96 .14	45.8 2.5	7.80 .11	77.8 1.7	50.64 .09	39.7 0.1
28.0	50.23 .64	46.5 3.4	40.04 .29	53.3 3.2	12.12 .18	43.3 2.5	7.94 .15	76.1 1.8	50.74 .12	39.5 0.3
Sept. 6.9	50.98 .85	43.2 3.3	40.38 .38	50.2 3.1	12.32 .23	40.8 2.5	8.10 .19	74.3 1.9	50.88 .15	39.1 0.5
16.9	51.93 1.04	39.9 3.1	40.80 .46	47.1 3.0	12.58 .27	38.3 2.5	8.31 .22	72.3 1.9	51.04 .18	38.5 0.7
26.9	53.07 1.23	36.9 2.9	41.30 .54	44.2 2.8	12.87 .32	35.8 2.5	8.54 .25	70.4 2.0	51.23 .21	37.7 0.9
Oct. 6.9	54.38 1.39	34.2 2.6	41.88 .61	41.5 2.6	13.21 .36	33.4 2.3	8.82 .29	68.4 2.0	51.45 .24	36.6 1.1
16.8	55.84 1.52	31.8 2.2	42.53 .68	39.1 2.3	13.59 .39	31.1 2.2	9.12 .32	66.4 2.0	51.70 .26	35.4 1.3
26.8	57.42 1.63	29.8 1.8	43.24 .73	37.0 1.9	14.00 .43	29.0 1.9	9.45 .34	64.5 1.9	51.98 .29	34.0 1.5
Nov. 5.8	59.10 1.71	28.3 1.3	43.99 .77	35.3 1.5	14.44 .45	27.2 1.7	9.80 .36	62.7 1.7	52.28 .31	32.4 1.7
15.8	60.83 1.75	27.3 0.7	44.77 .79	34.1 1.0	14.90 .47	25.7 1.4	10.18 .38	61.0 1.5	52.59 .32	30.6 1.8
25.7	62.58 1.74	26.8 0.2	45.56 .79	33.3 0.5	15.37 .47	24.5 1.0	10.56 .38	59.6 1.3	52.91 .32	28.8 1.8
Dec. 5.7	64.29 1.68	26.9 0.4	46.34 .77	33.1 0.0	15.84 .46	23.7 0.6	10.94 .38	58.4 1.0	53.24 .32	27.0 1.9
15.7	65.92 1.57	27.6 0.9	47.10 .73	33.4 0.5	16.30 .44	23.4 0.1	11.31 .36	57.5 0.7	53.55 .31	25.2 1.8
25.6	67.42 1.41	28.8 1.5	47.79 .67	34.2 1.1	16.72 .40	23.5 0.3	11.66 .33	56.9 0.4	53.85 .28	23.5 1.7
35.6	68.74 1.19	30.5 2.0	48.41 .58	35.5 1.6	17.10 .36	24.0 0.8	11.98 .30	56.7 0.1	54.12 .25	21.8 1.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Chamæleontis.		ε Leonis.		μ Leonis.		19 Leonis Minoris.		π Leonis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 9 36	° ′ −80 29	h m 9 40	° ′ +24 13	h m 9 47	° ′ +26 28	h m 9 51	° ′ +41 31	h m 9 54	° ′ + 8 30
	s	″	s	″	s	″	s	″	s	″
Jan. 0.6	56.17 .88	23.7 3.2	12.78 .29	50.8 0.9	6.82 .30	25.9 0.8	36.11 .35	36.8 0.0	57.78 .28	76.0 1.7
10.6	56.93 .65	27.1 3.5	13.04 .25	50.1 0.6	7.10 .26	25.2 0.5	36.44 .30	36.9 0.3	58.04 .24	74.4 1.5
20.6	57.46 .42	30.8 3.8	13.27 .20	49.6 0.3	7.33 .21	24.8 0.2	36.71 .25	37.3 0.6	58.26 .20	73.0 1.3
30.6	57.76 .18	34.6 3.9	13.45 .15	49.4 0.0	7.52 .16	24.8 0.1	36.93 .19	38.1 1.0	58.44 .15	71.8 1.0
Feb. 9.5	57.82 .05	38.6 3.9	13.57 .10	49.6 0.2	7.65 .10	25.0 0.4	37.08 .12	39.2 1.3	58.56 .10	71.0 0.7
19.5	57.65 .28	42.5 3.8	13.64 .04	50.0 0.4	7.73 .05	25.5 0.7	37.17 .06	40.6 1.5	58.64 .05	70.4 0.5
Mar. 1.5	57.26 .49	46.3 3.7	13.66 .01	50.5 0.6	7.75 .00	26.2 0.8	37.20 .00	42.2 1.6	58.67 .00	70.0 0.3
11.4	56.67 .69	49.8 3.5	13.62 .05	51.3 0.7	7.72 .05	27.1 0.9	37.16 .06	43.8 1.6	58.65 .03	69.8 0.1
21.4	55.90 .85	53.2 3.2	13.55 .09	52.1 0.8	7.65 .09	28.0 1.0	37.08 .11	45.5 1.6	58.60 .07	69.8 0.1
31.4	54.98 .99	56.1 2.8	13.44 .12	53.0 0.8	7.55 .12	29.0 1.0	36.95 .14	47.0 1.5	58.52 .10	70.0 0.2
Apr. 10.4	53.92 1.11	58.6 2.3	13.31 .14	53.8 0.8	7.42 .14	30.0 0.9	36.78 .17	48.5 1.3	58.41 .12	70.3 0.4
20.3	52.76 1.19	60.7 1.8	13.16 .15	54.6 0.7	7.27 .15	30.9 0.8	36.60 .19	49.7 1.1	58.28 .13	70.7 0.4
30.3	51.54 1.25	62.3 1.3	13.01 .15	55.3 0.6	7.11 .16	31.6 0.7	36.40 .20	50.7 0.9	58.15 .13	71.2 0.5
May 10.3	50.28 1.27	63.4 0.8	12.85 .15	55.9 0.5	6.95 .15	32.3 0.6	36.20 .20	51.5 0.6	58.02 .13	71.7 0.5
20.3	49.00 1.27	64.0 0.3	12.71 .14	56.4 0.4	6.81 .14	32.8 0.4	36.00 .19	51.9 0.3	57.89 .12	72.2 0.5
30.2	47.75 1.23	64.0 0.3	12.58 .12	56.7 0.2	6.67 .13	33.1 0.2	35.82 .17	52.0 0.0	57.77 .11	72.8 0.5
June 9.2	46.55 1.17	63.4 0.8	12.47 .10	56.8 0.1	6.55 .11	33.2 0.0	35.66 .15	51.8 0.3	57.67 .09	73.3 0.5
19.2	45.42 1.08	62.3 1.3	12.38 .08	56.8 0.1	6.45 .08	33.2 0.1	35.53 .12	51.3 0.6	57.58 .08	73.8 0.5
29.1	44.41 .95	60.8 1.7	12.31 .05	56.7 0.2	6.38 .06	33.0 0.3	35.43 .09	50.5 0.9	57.52 .06	74.2 0.4
July 9.1	43.53 .80	58.8 2.2	12.27 .03	56.4 0.4	6.34 .03	32.6 0.5	35.36 .06	49.4 1.2	57.47 .03	74.6 0.4
19.1	42.82 .62	56.4 2.6	12.26 .00	55.9 0.5	6.32 .00	32.0 0.6	35.32 .02	48.1 1.4	57.45 .00	75.0 0.3
29.1	42.29 .43	53.7 2.8	12.28 .03	55.3 0.7	6.33 .02	31.3 0.8	35.31 .01	46.6 1.6	57.45 .02	75.2 0.2
Aug. 8.0	41.97 .21	50.7 3.0	12.32 .06	54.6 0.8	6.36 .05	30.4 1.0	35.34 .05	44.9 1.8	57.48 .04	75.4 0.1
18.0	41.87 .01	47.6 3.1	12.40 .09	53.7 1.0	6.43 .08	29.4 1.1	35.41 .09	43.0 2.0	57.54 .07	75.4 0.1
28.0	42.00 .25	44.6 3.0	12.51 .12	52.6 1.1	6.53 .11	28.1 1.3	35.52 .13	41.0 2.1	57.62 .10	75.2 0.3
Sept. 7.0	42.36 .47	41.6 2.9	12.64 .15	51.4 1.3	6.66 .15	26.8 1.4	35.66 .16	38.8 2.2	57.73 .13	74.9 0.4
16.9	42.94 .69	38.8 2.7	12.81 .18	50.0 1.4	6.83 .18	25.3 1.6	35.84 .20	36.6 2.3	57.87 .16	74.3 0.6
26.9	43.75 .90	36.3 2.3	13.02 .21	48.5 1.5	7.02 .21	23.7 1.7	36.07 .24	34.3 2.3	58.05 .19	73.6 0.9
Oct. 6.9	44.74 1.08	34.2 1.8	13.25 .25	46.9 1.6	7.25 .24	21.9 1.8	36.33 .28	32.0 2.3	58.25 .22	72.6 1.1
16.8	45.90 1.22	32.6 1.3	13.51 .28	45.2 1.7	7.52 .27	20.1 1.8	36.63 .31	29.7 2.2	58.49 .25	71.4 1.3
26.8	47.19 1.32	31.6 0.6	13.80 .30	43.4 1.8	7.81 .30	18.2 1.9	36.96 .35	27.5 2.1	58.76 .28	69.9 1.5
Nov. 5.8	48.56 1.38	31.3 0.0	14.12 .32	41.6 1.8	8.12 .32	16.3 1.9	37.32 .37	25.4 2.0	59.05 .30	68.3 1.7
15.8	49.97 1.39	31.6 0.6	14.45 .34	39.8 1.7	8.46 .34	14.5 1.8	37.70 .39	23.6 1.7	59.35 .31	66.5 1.8
25.7	51.37 1.36	32.6 1.3	14.79 .34	38.1 1.6	8.81 .35	12.8 1.7	38.10 .40	21.9 1.5	59.68 .32	64.6 1.9
Dec. 5.7	52.70 1.27	34.2 1.9	15.14 .34	36.5 1.5	9.16 .35	11.2 1.5	38.51 .40	20.6 1.2	60.00 .32	62.7 1.9
15.7	53.92 1.14	36.4 2.4	15.48 .33	35.1 1.3	9.50 .34	9.8 1.3	38.91 .39	19.7 0.8	60.32 .31	60.8 1.9
25.7	54.99 .99	39.1 2.9	15.80 .31	33.9 1.0	9.83 .31	8.6 1.0	39.29 .36	19.1 0.4	60.62 .29	59.0 1.8
35.6	55.88 .80	42.2 3.4	16.09 .28	33.0 0.7	10.13 .28	7.8 0.6	39.64 .33	18.9 0.0	60.90 .26	57.3 1.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Leonis. (*Regulus.*)		32 Ursæ Majoris.		λ Ursæ Majoris.		γ¹ Leonis.		μ Hydræ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 10 3	° ′ +12 26	h m 10 10	° ′ +65 35	h m 10 11	° ′ +43 24	h m 10 14	° ′ +20 20	h m 10 21	° ′ −16 19
	s	″	s	″	s	″	s	″	s	″
Jan. 0.7	4.81 .29	69.7 1.6	49.87 .57	63.6 0.6	6.41 .38	30.5 0.2	29.58 .32	36.5 1.3	17.09 .30	36.4 2.6
10.6	5.08 .25	68.2 1.3	50.41 .51	64.6 1.2	6.76 .33	30.4 0.2	29.87 .27	35.4 1.0	17.36 .26	38.9 2.6
20.6	5.31 .21	67.1 1.1	50.88 .42	66.0 1.7	7.06 .27	30.8 0.6	30.12 .23	34.6 0.7	17.60 .21	41.5 2.5
30.6	5.50 .16	66.1 0.8	51.25 .32	67.9 2.0	7.30 .21	31.7 1.0	30.33 .18	34.1 0.4	17.79 .17	44.0 2.4
Feb. 9.5	5.64 .11	65.5 0.5	51.52 .22	70.1 2.3	7.48 .15	32.8 1.3	30.48 .13	33.9 0.1	17.94 .12	46.3 2.2
19.5	5.72 .06	65.1 0.3	51.68 .10	72.6 2.5	7.60 .08	34.3 1.5	30.58 .08	33.9 0.1	18.03 .07	48.4 2.0
Mar. 1.5	5.76 .01	65.0 0.0	51.73 .01	75.2 2.6	7.65 .02	35.9 1.7	30.64 .03	34.3 0.4	18.08 .03	50.3 1.8
11.5	5.75 .03	65.0 0.2	51.67 .11	77.9 2.6	7.64 .04	37.7 1.8	30.64 .02	34.8 0.6	18.08 .01	52.0 1.5
21.4	5.71 .06	65.3 0.3	51.51 .20	80.4 2.5	7.57 .09	39.5 1.8	30.60 .06	35.5 0.7	18.05 .05	53.4 1.2
31.4	5.63 .09	65.7 0.4	51.27 .28	82.8 2.2	7.45 .13	41.2 1.7	30.53 .09	36.3 0.8	17.98 .08	54.5 1.0
Apr. 10.4	5.52 .11	66.1 0.5	50.96 .34	84.9 1.9	7.30 .17	42.9 1.5	30.43 .11	37.1 0.8	17.89 .10	55.3 0.7
20.4	5.40 .13	66.7 0.6	50.59 .39	86.6 1.5	7.12 .19	44.3 1.3	30.30 .13	38.0 0.9	17.78 .12	55.8 0.4
30.3	5.27 .13	67.3 0.6	50.18 .41	87.9 1.1	6.92 .20	45.5 1.0	30.17 .14	38.8 0.9	17.65 .13	56.1 0.1
May 10.3	5.13 .13	67.8 0.6	49.77 .42	88.8 0.6	6.72 .20	46.4 0.7	30.03 .14	39.5 0.8	17.52 .13	56.1 0.1
20.3	5.00 .12	68.4 0.5	49.35 .42	89.1 0.1	6.52 .20	47.0 0.4	29.89 .13	40.1 0.7	17.39 .13	55.9 0.3
30.2	4.88 .11	68.9 0.5	48.94 .40	89.0 0.4	6.32 .18	47.2 0.1	29.76 .12	40.6 0.5	17.26 .12	55.4 0.6
June 9.2	4.77 .10	69.4 0.4	48.56 .36	88.3 0.9	6.15 .16	47.2 0.2	29.65 .11	41.0 0.3	17.14 .11	54.7 0.8
19.2	4.68 .08	69.8 0.4	48.22 .32	87.2 1.3	5.99 .14	46.8 0.6	29.55 .09	41.3 0.2	17.04 .10	53.9 1.0
29.2	4.61 .06	70.2 0.3	47.93 .27	85.7 1.7	5.87 .11	46.0 0.9	29.47 .07	41.4 0.0	16.94 .08	52.8 1.2
July 9.1	4.56 .04	70.4 0.2	47.69 .21	83.8 2.1	5.77 .08	45.0 1.2	29.40 .05	41.3 0.1	16.87 .06	51.6 1.3
19.1	4.53 .01	70.6 0.1	47.52 .14	81.6 2.4	5.70 .05	43.6 1.5	29.37 .02	41.1 0.3	16.81 .04	50.3 1.3
29.1	4.53 .01	70.6 0.0	47.40 .08	79.0 2.7	5.67 .01	42.1 1.7	29.35 .00	40.7 0.5	16.78 .02	48.9 1.4
Aug. 8.1	4.55 .03	70.5 0.2	47.36 .01	76.2 2.9	5.68 .02	40.3 1.9	29.36 .03	40.1 0.6	16.77 .00	47.6 1.4
18.0	4.60 .06	70.3 0.3	47.39 .06	73.2 3.1	5.72 .06	38.3 2.1	29.40 .05	39.4 0.8	16.79 .03	46.2 1.3
28.0	4.67 .09	69.8 0.5	47.49 .14	70.0 3.2	5.80 .10	36.1 2.2	29.47 .08	38.5 1.0	16.84 .06	45.0 1.1
Sept. 7.0	4.78 .12	69.3 0.7	47.66 .21	66.9 3.2	5.92 .14	33.8 2.4	29.57 .11	37.5 1.2	16.92 .10	43.9 0.9
16.9	4.92 .15	68.5 0.9	47.91 .28	63.6 3.2	6.08 .18	31.4 2.4	29.70 .14	36.2 1.3	17.04 .13	43.1 0.7
26.9	5.08 .18	67.5 1.1	48.23 .35	60.4 3.1	6.28 .22	28.9 2.5	29.86 .18	34.8 1.5	17.19 .17	42.5 0.4
Oct. 6.9	5.28 .22	66.3 1.3	48.62 .42	57.4 3.0	6.52 .26	26.4 2.5	30.06 .22	33.2 1.7	17.37 .20	42.3 0.0
16.9	5.52 .25	64.9 1.5	49.08 .49	54.5 2.8	6.81 .30	23.9 2.4	30.29 .25	31.5 1.8	17.60 .24	42.4 0.3
26.8	5.78 .28	63.4 1.6	49.59 .54	51.9 2.5	7.13 .34	21.5 2.3	30.56 .28	29.6 1.9	17.85 .27	43.0 0.7
Nov. 5.8	6.07 .30	61.6 1.8	50.16 .59	49.6 2.1	7.49 .37	19.3 2.1	30.85 .31	27.7 2.0	18.13 .30	43.9 1.1
15.8	6.38 .32	59.8 1.9	50.78 .63	47.6 1.7	7.87 .39	17.2 1.9	31.16 .33	25.7 2.0	18.44 .32	45.2 1.5
25.8	6.70 .33	57.9 1.9	51.42 .65	46.2 1.2	8.28 .41	15.4 1.6	31.50 .34	23.8 1.9	18.77 .33	46.9 1.8
Dec. 5.7	7.03 .33	56.0 1.9	52.08 .65	45.2 0.7	8.69 .41	14.0 1.3	31.84 .34	21.9 1.8	19.10 .33	48.9 2.1
15.7	7.36 .32	54.2 1.8	52.73 .64	44.7 0.2	9.10 .40	12.8 0.9	32.18 .33	20.2 1.6	19.43 .32	51.1 2.3
25.7	7.67 .30	52.4 1.6	53.36 .59	44.8 0.4	9.50 .38	12.1 0.4	32.51 .32	18.6 1.4	19.74 .30	53.6 2.5
35.6	7.95 .27	50.9 1.5	53.93 .53	45.4 0.9	9.87 .36	11.9 0.0	32.81 .30	17.4 1.2	20.03 .28	56.1 2.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Leonis Minoris.		α Antliæ.		9 Draconis. (H.)		ρ Leonis.		41 Leonis Minoris.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 10 22	° ′ +37 12	h m 10 22	° ′ −30 33	h m 10 26	° ′ +76 12	h m 10 27	° ′ + 9 48	h m 10 38	° ′ +23 42
	s	″	s	″	s	″	s	″	s	″
Jan. 0.7	8.28 .36	52.2 0.6	36.45 .32	31.7 2.8	40.71 .99	77.3 0.8	34.63 .31	65.0 1.7	0.65 .32	27.4 1.3
10.6	8.61 .31	51.8 0.2	36.74 .27	34.6 3.0	41.61 .85	78.4 1.4	34.92 .27	63.4 1.5	0.96 .29	26.3 0.9
20.6	8.90 .26	51.8 0.2	36.99 .22	37.7 3.1	42.40 .71	80.1 1.9	35.16 .23	62.0 1.3	1.23 .25	25.6 0.6
30.6	9.14 .21	52.2 0.6	37.19 .17	40.7 3.0	43.03 .56	82.2 2.3	35.37 .18	60.8 1.0	1.46 .21	25.1 0.2
Feb. 9.6	9.32 .15	53.0 0.9	37.34 .12	43.7 2.9	43.50 .38	84.7 2.6	35.53 .13	60.0 0.7	1.64 .16	25.1 0.1
19.5	9.45 .09	54.0 1.2	37.43 .07	46.5 2.7	43.79 .20	87.5 2.9	35.64 .09	59.4 0.5	1.77 .10	25.3 0.4
Mar. 1.5	9.51 .04	55.4 1.4	37.48 .02	49.2 2.5	43.89 .01	90.4 3.0	35.70 .04	59.0 0.2	1.85 .05	25.8 0.6
11.5	9.52 .02	56.8 1.5	37.48 .02	51.6 2.3	43.81 .17	93.4 2.9	35.72 .00	58.9 0.0	1.88 .00	26.6 0.8
21.4	9.47 .07	58.4 1.6	37.43 .06	53.7 2.0	43.56 .33	96.2 2.8	35.70 .04	59.0 0.2	1.86 .04	27.5 1.0
31.4	9.38 .11	60.0 1.5	37.35 .10	55.5 1.6	43.15 .48	98.9 2.5	35.64 .07	59.3 0.4	1.80 .07	28.5 1.1
Apr. 10.4	9.26 .14	61.5 1.4	37.24 .12	57.0 1.3	42.60 .60	101.2 2.1	35.56 .10	59.8 0.5	1.71 .10	29.6 1.1
20.4	9.11 .16	62.8 1.3	37.10 .14	58.1 0.9	41.96 .69	103.1 1.7	35.45 .11	60.2 0.5	1.60 .12	30.7 1.0
30.3	8.94 .18	64.0 1.1	36.96 .15	58.9 0.6	41.23 .75	104.6 1.2	35.33 .12	60.8 0.6	1.47 .13	31.7 0.9
May 10.3	8.75 .18	65.0 0.8	36.81 .16	59.3 0.2	40.45 .79	105.6 0.7	35.21 .12	61.4 0.6	1.34 .14	32.6 0.8
20.3	8.59 .17	65.7 0.6	36.65 .16	59.4 0.1	39.66 .79	106.0 0.2	35.08 .12	62.0 0.6	1.20 .14	33.3 0.7
30.3	8.42 .16	66.1 0.3	36.50 .15	59.0 0.5	38.88 .77	105.8 0.4	34.97 .11	62.6 0.6	1.06 .13	34.0 0.5
June 9.2	8.26 .15	66.3 0.0	36.35 .14	58.4 0.8	38.13 .72	105.2 0.9	34.86 .10	63.2 0.5	0.94 .12	34.4 0.4
19.2	8.13 .13	66.1 0.3	36.22 .13	57.5 1.1	37.44 .66	104.0 1.4	34.76 .09	63.7 0.5	0.82 .11	34.7 0.2
29.2	8.01 .10	65.7 0.6	36.10 .11	56.2 1.4	36.82 .57	102.3 1.9	34.68 .07	64.1 0.4	0.73 .09	34.8 0.0
July 9.1	7.92 .08	65.0 0.9	36.00 .09	54.7 1.6	36.29 .48	100.2 2.3	34.61 .06	64.5 0.3	0.64 .07	34.6 0.2
19.1	7.86 .05	64.0 1.1	35.92 .07	53.0 1.8	35.86 .37	97.7 2.7	34.56 .04	64.8 0.2	0.58 .05	34.3 0.4
29.1	7.82 .02	62.7 1.3	35.87 .04	51.2 1.9	35.55 .25	94.8 3.0	34.54 .01	64.9 0.1	0.55 .03	33.8 0.6
Aug. 8.1	7.82 .01	61.3 1.5	35.84 .01	49.2 2.0	35.35 .13	91.7 3.2	34.54 .01	65.0 0.0	0.53 .00	33.1 0.8
18.0	7.84 .04	59.6 1.7	35.85 .02	47.2 2.0	35.28 .01	88.4 3.4	34.56 .04	64.9 0.2	0.55 .03	32.2 1.0
28.0	7.91 .08	57.8 1.9	35.89 .06	45.3 1.9	35.34 .12	84.9 3.5	34.61 .07	64.6 0.4	0.59 .06	31.1 1.2
Sept. 7.0	8.01 .12	55.7 2.1	35.97 .10	43.5 1.7	35.53 .25	81.4 3.5	34.69 .10	64.2 0.5	0.66 .09	29.8 1.4
17.0	8.14 .16	53.6 2.2	36.08 .14	41.9 1.4	35.85 .38	77.9 3.5	34.80 .13	63.5 0.7	0.77 .12	28.3 1.5
26.9	8.32 .20	51.3 2.3	36.24 .18	40.6 1.1	36.30 .51	74.4 3.4	34.95 .16	62.6 0.9	0.91 .16	26.7 1.7
Oct. 6.9	8.53 .23	49.0 2.3	36.44 .22	39.7 0.7	36.87 .63	71.0 3.2	35.13 .20	61.5 1.1	1.08 .20	24.9 1.9
16.9	8.78 .27	46.6 2.4	36.68 .26	39.2 0.2	37.56 .74	67.9 3.0	35.34 .23	60.2 1.4	1.30 .23	22.9 2.0
26.8	9.08 .31	44.2 2.3	36.96 .29	39.1 0.2	38.36 .85	65.1 2.6	35.58 .26	58.6 1.6	1.55 .27	20.8 2.1
Nov. 5.8	9.40 .34	42.0 2.2	37.27 .32	39.6 0.7	39.26 .93	62.7 2.2	35.86 .29	56.9 1.8	1.83 .30	18.7 2.1
15.8	9.75 .36	39.8 2.1	37.60 .34	40.5 1.2	40.23 1.00	60.6 1.8	36.16 .31	55.0 1.9	2.14 .32	16.6 2.1
25.8	10.13 .38	37.9 1.8	37.95 .35	42.0 1.7	41.26 1.04	59.1 1.3	36.48 .32	53.1 2.0	2.47 .34	14.5 2.0
Dec. 5.7	10.51 .38	36.2 1.5	38.31 .35	43.9 2.1	42.32 1.06	58.1 0.7	36.81 .33	51.1 2.0	2.82 .35	12.6 1.9
15.7	10.90 .38	34.8 1.2	38.66 .34	46.1 2.4	43.38 1.04	57.7 0.1	37.13 .32	49.1 1.9	3.16 .34	10.8 1.7
25.7	11.27 .37	33.8 0.8	39.00 .32	48.7 2.7	44.40 1.00	57.9 0.5	37.45 .31	47.2 1.8	3.51 .33	9.2 1.4
35.7	11.62 .35	33.1 0.4	39.31 .29	51.5 2.9	45.36 .93	58.8 1.1	37.75 .29	45.5 1.6	3.83 .30	7.9 1.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Argûs.		*l* Leonis.		δ² Chamæleontis.		46 Leonis Minoris.		Groombridge 1706.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 10 41	° ′ −59 9	h m 10 44	° ′ +11 3	h m 10 44	° ′ −80 0	h m 10 47	° ′ +34 44	h m 10 51	° ′ +78 17
	s	″	s	″	s	″	s	″	s	″
Jan. 0.7	13.15 .46	24.2 2.9	1.86 .32	75.5 1.7	55.48 1.15	36.0 2.5	45.11 .36	55.9 0.9	61.87 1.14	55.8 0.6
10.6	13.58 .40	27.3 3.2	2.15 .28	73.8 1.5	56.54 .98	38.8 3.0	45.46 .32	55.2 0.5	62.96 1.04	56.7 1.2
20.6	13.94 .33	30.7 3.5	2.42 .24	72.4 1.3	57.43 .79	42.0 3.4	45.76 .28	54.9 0.1	63.94 .90	58.2 1.7
30.6	14.24 .26	34.4 3.7	2.64 .20	71.3 1.0	58.13 .59	45.6 3.7	46.02 .23	55.0 0.3	64.76 .72	60.2 2.2
Feb. 9.6	14.45 .18	38.1 3.8	2.81 .15	70.5 0.9	58.62 .39	49.4 3.9	46.22 .18	55.5 0.7	65.39 .54	62.6 2.6
19.5	14.59 .10	41.8 3.7	2.94 .10	69.9 0.4	58.90 .17	53.3 3.9	46.37 .12	56.4 1.0	65.83 .33	65.3 2.8
Mar. 1.5	14.65 .02	45.6 3.6	3.02 .05	69.6 0.1	58.97 .03	57.2 3.9	46.47 .07	57.5 1.3	66.06 .12	68.2 3.0
11.5	14.64 .05	49.1 3.4	3.05 .01	69.6 0.1	58.83 .23	61.1 3.8	46.51 .01	58.9 1.4	66.06 .10	71.3 3.0
21.5	14.56 .11	52.4 3.2	3.05 .03	69.8 0.3	58.51 .41	64.9 3.6	46.49 .04	60.4 1.5	65.86 .30	74.2 2.9
31.4	14.42 .16	55.5 2.9	3.00 .06	70.2 0.4	58.01 .58	68.4 3.4	46.43 .08	62.0 1.6	65.47 .48	77.1 2.7
Apr. 10.4	14.23 .21	58.2 2.5	2.93 .08	70.7 0.6	57.35 .73	71.6 3.0	46.34 .11	63.5 1.5	64.91 .64	79.6 2.4
20.4	14.00 .25	60.5 2.1	2.84 .10	71.3 0.6	56.55 .86	74.5 2.6	46.21 .13	65.0 1.4	64.21 .76	81.8 2.0
30.3	13.73 .28	62.3 1.6	2.73 .11	72.0 0.7	55.64 .96	76.9 2.2	46.07 .15	66.3 1.2	63.40 .86	83.6 1.5
May 10.3	13.44 .30	63.8 1.2	2.61 .12	72.6 0.7	54.63 1.04	78.9 1.7	45.91 .16	67.4 1.0	62.51 .92	84.8 1.0
20.3	13.13 .31	64.7 0.7	2.49 .12	73.3 0.7	53.56 1.09	80.4 1.2	45.75 .16	68.3 0.8	61.57 .94	85.6 0.4
30.3	12.81 .32	65.1 0.2	2.37 .11	73.9 0.6	52.45 1.12	81.3 0.7	45.59 .16	69.0 0.5	60.63 .94	85.7 0.1
June 9.2	12.50 .31	65.0 0.3	2.26 .11	74.5 0.5	51.32 1.12	81.7 0.1	45.44 .15	69.4 0.2	59.70 .91	85.3 0.7
19.2	12.19 .30	64.4 0.8	2.16 .10	75.0 0.5	50.21 1.09	81.5 0.4	45.30 .13	69.4 0.1	58.82 .85	84.4 1.2
29.2	11.90 .28	63.3 1.3	2.07 .08	75.5 0.4	49.14 1.04	80.8 1.0	45.17 .11	69.2 0.3	58.01 .77	83.0 1.7
July 9.2	11.64 .25	61.8 1.7	1.99 .07	75.8 0.3	48.14 .95	79.6 1.5	45.07 .09	68.7 0.6	57.28 .67	81.0 2.1
19.1	11.41 .21	59.9 2.1	1.93 .05	76.0 0.2	47.25 .83	77.8 2.0	44.98 .07	68.0 0.9	56.66 .55	78.7 2.5
29.1	11.22 .16	57.6 2.4	1.90 .03	76.1 0.0	46.49 .69	75.7 2.4	44.92 .05	66.9 1.1	56.17 .43	76.0 2.9
Aug. 8.1	11.08 .11	55.1 2.6	1.88 .00	76.1 0.1	45.89 .52	73.1 2.7	44.90 .02	65.7 1.4	55.80 .29	72.9 3.2
18.0	11.00 .05	52.4 2.8	1.89 .02	75.9 0.3	45.47 .32	70.3 2.9	44.89 .01	64.2 1.6	55.58 .15	69.6 3.4
28.0	10.98 .01	49.6 2.8	1.92 .05	75.6 0.5	45.25 .11	67.3 3.1	44.92 .05	62.4 1.8	55.50 .00	66.1 3.5
Sept. 7.0	11.03 .08	46.7 2.8	1.99 .08	75.0 0.7	45.25 .11	64.2 3.1	44.99 .08	60.5 2.0	55.58 .15	62.5 3.6
17.0	11.15 .16	44.0 2.6	2.08 .11	74.3 0.9	45.48 .34	61.2 3.0	45.09 .12	58.4 2.2	55.81 .31	58.8 3.6
26.9	11.35 .23	41.5 2.3	2.21 .14	73.3 1.1	45.93 .56	58.2 2.8	45.23 .16	56.2 2.3	56.19 .46	55.2 3.6
Oct. 6.9	11.62 .30	39.4 1.9	2.37 .18	72.1 1.3	46.60 .77	55.6 2.5	45.41 .20	53.8 2.4	56.73 .61	51.7 3.4
16.9	11.96 .37	37.6 1.5	2.57 .22	70.7 1.5	47.48 .96	53.3 2.0	45.63 .24	51.4 2.4	57.41 .75	48.3 3.2
26.9	12.36 .43	36.4 0.9	2.81 .25	69.1 1.7	48.53 1.12	51.6 1.5	45.89 .28	48.9 2.4	58.24 .89	45.2 2.9
Nov. 5.8	12.81 .48	35.8 0.3	3.07 .28	67.3 1.9	49.72 1.25	50.3 0.9	46.19 .31	46.5 2.4	59.18 1.00	42.5 2.5
15.8	13.31 .51	35.7 0.3	3.37 .30	65.3 2.0	51.02 1.33	49.7 0.3	46.52 .34	44.2 2.3	60.24 1.10	40.2 2.1
25.8	13.84 .53	36.3 0.9	3.68 .32	63.3 2.0	52.39 1.37	49.7 0.3	46.87 .36	42.0 2.1	61.38 1.17	38.3 1.6
Dec. 5.7	14.37 .53	37.5 1.5	4.01 .33	61.3 2.0	53.77 1.37	50.4 1.0	47.25 .38	40.0 1.8	62.58 1.21	37.0 1.0
15.7	14.89 .51	39.4 2.1	4.34 .33	59.3 1.9	55.11 1.31	51.7 1.7	47.62 .37	38.4 1.5	63.79 1.21	36.4 0.4
25.7	15.39 .48	41.7 2.6	4.66 .32	57.4 1.8	56.38 1.22	53.7 2.2	48.00 .36	37.0 1.1	64.99 1.17	36.2 0.2
35.7	15.85 .43	44.5 3.1	4.97 .30	55.6 1.6	57.52 1.08	56.1 2.7	48.35 .34	36.1 0.7	66.14 1.10	36.8 0.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Majoris.		η Octantis.		p^3 Leonis.		ψ Ursæ Majoris.		δ Leonis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 10 57	° ′ +62 16	h m 10 59	° ′ −84 3	h m 11 1	° ′ + 2 29	h m 11 4	° ′ +45 1	h m 11 8	° ′ +21 3
	s	″	s	″	s	″	s	″	s	″
Jan. 0.7	35.96 .59	63.0 0.1	67.68 1.92	10.4 2.3	49.83 .31	45.0 2.1	4.47 .42	66.6 0.7	49.11 .33	62.4 1.5
10.7	36.49 .52	63.3 0.6	69.49 1.69	13.0 2.8	50.13 .28	43.0 1.9	4.86 .37	66.2 0.2	49.43 .30	61.0 1.2
20.6	36.98 .45	64.1 1.1	71.03 1.40	16.0 3.2	50.40 .25	41.2 1.7	5.21 .33	66.3 0.3	49.72 .27	60.0 0.9
30.6	37.39 .37	65.4 1.6	72.28 1.08	19.4 3.5	50.63 .21	39.6 1.5	5.52 .28	66.8 0.8	49.97 .23	59.3 0.5
Feb. 9.6	37.72 .29	67.3 2.0	73.19 .75	23.1 3.7	50.81 .16	38.3 1.2	5.77 .22	67.8 1.2	50.17 .18	58.9 0.2
19.5	37.96 .19	69.5 2.3	73.78 .41	26.9 3.9	50.96 .12	37.2 0.9	5.95 .15	69.1 1.5	50.33 .13	58.9 0.2
Mar. 1.5	38.10 .09	71.9 2.5	74.01 .07	30.8 3.9	51.05 .07	36.4 0.7	6.08 .09	70.8 1.8	50.44 .08	59.3 0.5
11.5	38.15 .00	74.5 2.6	73.91 .26	34.8 3.9	51.10 .03	35.8 0.4	6.13 .03	72.7 2.0	50.50 .04	59.8 0.7
21.5	38.10 .09	77.2 2.7	73.49 .57	38.6 3.7	51.11 .01	35.5 0.2	6.13 .03	74.7 2.1	50.52 .00	60.6 0.9
31.4	37.97 .17	79.7 2.5	72.77 .87	42.2 3.5	51.09 .04	35.4 0.0	6.07 .08	76.8 2.0	50.50 .04	61.6 1.0
Apr. 10.4	37.77 .23	82.2 2.3	71.77 1.13	45.6 3.2	51.04 .07	35.5 0.2	5.97 .12	78.8 1.9	50.44 .07	62.6 1.1
20.4	37.51 .28	84.3 2.0	70.52 1.36	48.7 2.9	50.96 .09	35.8 0.3	5.83 .16	80.7 1.8	50.35 .10	63.7 1.1
30.4	37.20 .32	86.1 1.6	69.06 1.56	51.4 2.5	50.86 .10	36.1 0.4	5.66 .18	82.3 1.5	50.25 .11	64.8 1.0
May 10.3	36.87 .35	87.6 1.2	67.42 1.71	53.6 2.0	50.76 .11	36.6 0.5	5.47 .19	83.8 1.2	50.13 .12	65.8 0.9
20.3	36.51 .36	88.5 0.8	65.63 1.83	55.4 1.5	50.65 .11	37.1 0.6	5.27 .20	84.8 0.9	50.01 .13	66.7 0.8
30.3	36.16 .35	89.0 0.3	63.76 1.91	56.6 1.0	50.54 .11	37.7 0.6	5.07 .20	85.6 0.6	49.88 .12	67.5 0.7
June 9.2	35.81 .34	89.0 0.2	61.83 1.94	57.3 0.4	50.42 .11	38.4 0.6	4.87 .19	85.9 0.2	49.76 .12	68.1 0.5
19.2	35.48 .32	88.6 0.7	59.90 1.91	57.4 0.1	50.32 .10	39.0 0.6	4.69 .18	85.9 0.2	49.64 .11	68.5 0.4
29.2	35.17 .29	87.6 1.2	58.02 1.84	57.0 0.7	50.23 .09	39.6 0.6	4.52 .16	85.6 0.6	49.53 .10	68.8 0.2
July 9.2	34.90 .25	86.3 1.6	56.24 1.71	56.0 1.2	50.15 .07	40.2 0.6	4.37 .14	84.8 0.9	49.44 .09	68.9 0.0
19.1	34.68 .20	84.5 2.0	54.62 1.52	54.5 1.7	50.08 .06	40.8 0.5	4.24 .11	83.8 1.2	49.36 .07	68.8 0.2
29.1	34.50 .15	82.3 2.3	53.20 1.30	52.6 2.2	50.03 .04	41.3 0.5	4.14 .08	82.3 1.6	49.30 .05	68.4 0.4
Aug. 8.1	34.37 .10	79.8 2.6	52.04 1.03	50.2 2.5	50.00 .02	41.7 0.4	4.08 .05	80.6 1.9	49.26 .03	67.9 0.6
18.1	34.30 .04	77.1 2.9	51.17 .71	47.5 2.8	49.99 .00	42.0 0.2	4.04 .02	78.6 2.1	49.24 .00	67.2 0.8
28.0	34.29 .02	74.1 3.1	50.64 .36	44.6 3.0	50.00 .03	42.1 0.1	4.04 .02	76.4 2.3	49.25 .02	66.2 1.0
Sept. 7.0	34.34 .08	70.9 3.2	50.46 .02	41.5 3.1	50.05 .06	42.1 0.1	4.09 .06	74.0 2.5	49.29 .05	65.1 1.3
17.0	34.45 .15	67.6 3.3	50.67 .40	38.4 3.0	50.12 .09	41.8 0.4	4.17 .11	71.3 2.7	49.36 .09	63.7 1.5
26.9	34.64 .22	64.3 3.3	51.27 .78	35.4 2.9	50.23 .13	41.4 0.6	4.30 .15	68.6 2.8	49.47 .12	62.2 1.7
Oct. 6.9	34.89 .29	61.0 3.2	52.24 1.15	32.6 2.6	50.38 .16	40.6 0.9	4.48 .20	65.8 2.8	49.61 .16	60.4 1.9
16.9	35.21 .35	57.7 3.1	53.56 1.48	30.1 2.2	50.56 .20	39.6 1.1	4.70 .25	62.9 2.8	49.79 .20	58.5 2.0
26.9	35.60 .42	54.7 2.9	55.19 1.76	28.1 1.8	50.78 .23	38.3 1.4	4.98 .29	60.1 2.8	50.01 .24	56.4 2.1
Nov. 5.8	36.05 .47	51.8 2.7	57.08 1.99	26.6 1.2	51.03 .26	36.8 1.6	5.29 .33	57.4 2.6	50.27 .27	54.2 2.2
15.8	36.55 .52	49.3 2.4	59.16 2.16	25.7 0.6	51.31 .29	35.1 1.8	5.64 .37	54.8 2.4	50.56 .30	52.0 2.2
25.8	37.09 .56	47.2 1.9	61.37 2.25	25.4 0.0	51.62 .31	33.2 2.0	6.03 .40	52.5 2.2	50.88 .32	49.8 2.1
Dec. 5.8	37.67 .58	45.5 1.4	63.62 2.25	25.8 0.7	51.94 .32	31.1 2.1	6.44 .41	50.5 1.8	51.21 .34	47.6 2.0
15.7	38.25 .59	44.3 0.9	65.85 2.18	26.8 1.3	52.27 .33	29.0 2.1	6.86 .42	48.9 1.4	51.56 .34	45.6 1.9
25.7	38.84 .58	43.7 0.3	67.96 2.04	28.4 1.9	52.59 .32	26.9 2.1	7.28 .41	47.7 1.0	51.90 .34	43.8 1.7
35.7	39.40 .55	43.6 0.3	69.90 1.83	30.6 2.5	52.90 .30	24.9 2.0	7.69 .40	47.0 0.5	52.23 .32	42.3 1.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ν Ursæ Majoris.		δ Crateris.		τ Leonis.		λ Draconis.		ξ Hydræ.	
	Right Ascension.	**Declination** *North.*	**Right Ascension.**	**Declination** *South.*	**Right Ascension.**	**Declination** *North.*	**Right Ascension.**	**Declination** *North.*	**Right Ascension.**	**Declination** *South.*
	h m	° '	h m	° '	h m	° '	h m	° '	h m	° '
	11 13	+33 37	11 14	−14 14	11 22	+ 3 23	11 25	+69 52	11 28	−31 18
	s	"	s	"	s	"	s	"	s	"
Jan. 0.7	6.40 .37	65.0 1.2	22.02 .33	18.4 2.4	49.21 .32	75.5 2.1	30.48 .74	33.0 0.1	6.54 .35	14.2 2.5
10.7	6.75 .33	64.1 0.7	22.33 .29	20.8 2.4	49.52 .29	73.5 1.9	31.20 .69	33.2 0.5	6.87 .32	16.8 2.7
20.7	7.06 .30	63.6 0.3	22.60 .26	23.2 2.4	49.80 .26	71.7 1.7	31.86 .62	34.0 1.1	7.18 .29	19.6 2.8
30.6	7.34 .25	63.5 0.1	22.84 .22	25.5 2.3	50.05 .23	70.1 1.5	32.44 .53	35.4 1.6	7.45 .25	22.4 2.9
Feb. 9.6	7.57 .20	63.8 0.5	23.04 .18	27.7 2.1	50.25 .19	68.8 1.2	32.92 .43	37.2 2.1	7.67 .20	25.3 2.8
19.6	7.75 .15	64.6 0.9	23.19 .13	29.8 1.9	50.41 .14	67.7 0.9	33.28 .31	39.5 2.5	7.85 .15	28.1 2.7
Mar. 1.5	7.87 .09	65.6 1.2	23.30 .08	31.6 1.7	50.53 .09	66.9 0.6	33.53 .18	42.2 2.7	7.97 .10	30.8 2.6
11.5	7.94 .04	66.9 1.4	23.36 .04	33.1 1.4	50.60 .05	66.4 0.4	33.65 .06	45.0 2.9	8.05 .06	33.3 2.4
21.5	7.95 .01	68.4 1.5	23.38 .00	34.4 1.2	50.64 .01	66.2 0.1	33.64 .06	47.9 2.9	8.09 .02	35.6 2.2
31.5	7.92 .05	70.0 1.6	23.37 .03	35.5 0.9	50.63 .02	66.1 0.1	33.52 .18	50.8 2.8	8.08 .01	37.6 1.9
Apr. 10.4	7.86 .08	71.6 1.6	23.33 .06	36.3 0.7	50.60 .05	66.3 0.2	33.29 .28	53.5 2.6	8.04 .05	39.4 1.6
20.4	7.75 .11	73.2 1.5	23.26 .08	36.9 0.4	50.54 .07	66.6 0.4	32.97 .36	56.0 2.3	7.97 .08	40.8 1.3
30.4	7.63 .13	74.7 1.4	23.17 .10	37.2 0.2	50.45 .09	67.0 0.5	32.57 .43	58.1 1.9	7.88 .10	42.0 1.0
May 10.4	7.49 .15	76.0 1.2	23.07 .11	37.3 0.0	50.36 .10	67.6 0.6	32.12 .47	59.8 1.5	7.77 .12	42.8 0.7
20.3	7.34 .15	77.1 1.0	22.96 .11	37.2 0.2	50.26 .11	68.2 0.6	31.63 .50	61.0 1.0	7.64 .13	43.3 0.3
30.3	7.18 .15	78.0 0.7	22.84 .11	36.9 0.4	50.15 .11	68.8 0.6	31.12 .52	61.8 0.5	7.51 .14	43.4 0.0
June 9.3	7.03 .15	78.6 0.4	22.73 .11	36.4 0.6	50.04 .10	69.4 0.6	30.60 .51	62.0 0.0	7.37 .14	43.3 0.3
19.2	6.89 .14	78.8 0.1	22.62 .11	35.7 0.8	49.94 .10	70.1 0.6	30.10 .49	61.7 0.5	7.23 .14	42.8 0.6
29.2	6.75 .12	78.8 0.2	22.52 .10	34.9 0.9	49.84 .09	70.7 0.6	29.62 .46	60.9 1.0	7.09 .13	42.0 0.9
July 9.2	6.64 .11	78.6 0.4	22.42 .09	33.9 1.0	49.75 .08	71.3 0.5	29.18 .42	59.6 1.5	6.97 .12	41.0 1.2
19.2	6.53 .09	78.0 0.7	22.34 .08	32.9 1.1	49.67 .07	71.8 0.5	28.78 .37	57.8 2.0	6.85 .11	39.7 1.4
29.1	6.45 .07	77.1 1.0	22.27 .06	31.8 1.1	49.61 .06	72.3 0.4	28.44 .31	55.6 2.4	6.75 .09	38.2 1.6
Aug. 8.1	6.40 .04	76.0 1.3	22.22 .04	30.6 1.1	49.56 .04	72.6 0.3	28.17 .24	53.1 2.7	6.66 .07	36.5 1.7
18.1	6.36 .01	74.6 1.5	22.19 .01	29.5 1.1	49.53 .02	72.9 0.2	27.97 .16	50.2 3.0	6.60 .04	34.7 1.8
28.1	6.36 .02	73.0 1.8	22.19 .01	28.4 1.0	49.53 .01	72.9 0.0	27.85 .08	47.0 3.3	6.58 .01	32.9 1.8
Sept. 7.0	6.40 .05	71.1 2.0	22.22 .04	27.5 0.8	49.55 .04	72.8 0.2	27.81 .01	43.6 3.5	6.58 .03	31.1 1.7
17.0	6.47 .09	69.0 2.2	22.28 .08	26.8 0.6	49.60 .07	72.5 0.4	27.86 .10	40.1 3.6	6.63 .07	29.5 1.6
27.0	6.57 .13	66.8 2.3	22.38 .12	26.3 0.4	49.69 .11	72.0 0.7	28.00 .19	36.5 3.6	6.72 .11	28.0 1.3
Oct. 6.9	6.72 .17	64.4 2.4	22.51 .16	26.0 0.1	49.82 .15	71.2 0.9	28.24 .28	32.9 3.6	6.85 .16	26.9 1.0
16.9	6.91 .21	61.9 2.5	22.69 .20	26.2 0.3	49.98 .18	70.1 1.2	28.57 .38	29.4 3.5	7.03 .20	26.0 0.6
26.9	7.14 .25	59.4 2.5	22.91 .23	26.6 0.6	50.18 .22	68.8 1.4	29.00 .47	26.0 3.3	7.26 .25	25.6 0.2
Nov. 5.9	7.42 .29	56.8 2.5	23.16 .27	27.4 1.0	50.42 .25	67.3 1.6	29.51 .55	22.9 3.0	7.53 .29	25.6 0.2
15.8	7.73 .32	54.4 2.4	23.44 .30	28.6 1.3	50.69 .28	65.5 1.8	30.10 .63	20.1 2.6	7.84 .32	26.0 0.7
25.8	8.06 .35	52.0 2.3	23.75 .32	30.1 1.7	50.99 .31	63.6 2.0	30.76 .68	17.7 2.1	8.17 .35	26.9 1.2
Dec. 5.8	8.43 .37	49.9 2.0	24.08 .33	31.9 2.0	51.31 .32	61.5 2.1	31.47 .73	15.8 1.6	8.53 .36	28.3 1.6
15.7	8.80 .37	48.0 1.7	24.42 .33	34.0 2.2	51.64 .33	59.4 2.1	32.22 .75	14.4 1.1	8.90 .37	30.1 2.0
25.7	9.17 .37	46.4 1.4	24.75 .33	36.2 2.3	51.97 .32	57.2 2.1	32.97 .74	13.6 0.5	9.26 .36	32.3 2.3
35.7	9.53 .35	45.2 1.0	25.07 .31	38.6 2.4	52.28 .30	55.2 2.0	33.70 .72	13.5 0.1	9.61 .34	34.7 2.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*υ* Leonis.		*χ* Ursæ Majoris.		*β* Leonis.		*γ* Ursæ Majoris.		*π* Virginis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	11 31	− 0 16	11 40	+48 19	11 43	+15 7	11 48	+54 14	11 55	+ 7 9
	s	″	s	″	s	″	s	″	s	″
Jan. 0.7	51.19 .32	26.3 2.2	47.82 .45	39.1 1.0	58.96 .33	38.2 1.9	35.83 .50	38.6 0.9	46.23 .32	68.0 2.1
10.7	51.50 .30	28.4 2.0	48.24 .41	38.5 0.4	59.29 .31	36.5 1.6	36.30 .46	38.1 0.3	46.55 .31	66.0 1.8
20.7	51.79 .27	30.4 1.8	48.64 .37	38.3 0.1	59.59 .28	35.0 1.3	36.74 .42	38.1 0.3	46.85 .28	64.3 1.6
30.6	52.04 .23	32.1 1.6	48.99 .33	38.7 0.6	59.85 .25	33.9 0.9	37.14 .37	38.6 0.8	47.12 .25	62.8 1.3
Feb. 9.6	52.25 .19	33.6 1.4	49.29 .27	39.6 1.1	60.08 .21	33.1 0.6	37.48 .31	39.7 1.3	47.36 .21	61.6 1.0
19.6	52.42 .15	34.9 1.1	49.53 .21	40.9 1.5	60.27 .16	32.7 0.3	37.76 .24	41.3 1.7	47.55 .17	60.8 0.7
Mar. 1.6	52.55 .10	35.9 0.9	49.71 .14	42.7 1.9	60.41 .12	32.6 0.0	37.96 .17	43.2 2.1	47.70 .13	60.2 0.4
11.5	52.63 .06	36.6 0.6	49.82 .08	44.7 2.1	60.50 .07	32.8 0.3	38.09 .09	45.5 2.3	47.80 .09	59.9 0.1
21.5	52.67 .02	37.1 0.4	49.86 .02	46.9 2.3	60.56 .03	33.3 0.5	38.15 .02	47.9 2.5	47.87 .05	59.9 0.1
31.5	52.68 .01	37.4 0.2	49.85 .04	49.2 2.3	60.57 .00	33.9 0.7	38.14 .04	50.4 2.5	47.90 .01	60.1 0.3
Apr. 10.4	52.65 .04	37.4 0.0	49.78 .09	51.5 2.2	60.55 .03	34.8 0.9	38.06 .10	53.0 2.5	47.89 .02	60.5 0.5
20.4	52.60 .06	37.2 0.2	49.67 .13	53.7 2.1	60.50 .06	35.7 1.0	37.93 .15	55.4 2.3	47.86 .05	61.0 0.6
30.4	52.52 .08	37.0 0.3	49.51 .17	55.7 1.9	60.43 .08	36.7 1.0	37.76 .19	57.6 2.1	47.80 .07	61.7 0.7
May 10.4	52.44 .09	36.6 0.4	49.33 .19	57.5 1.6	60.34 .10	37.7 1.0	37.55 .22	59.5 1.7	47.73 .08	62.4 0.8
20.3	52.34 .10	36.1 0.5	49.13 .21	59.0 1.3	60.23 .11	38.6 0.9	37.31 .24	61.1 1.4	47.64 .09	63.2 0.8
30.3	52.24 .10	35.5 0.6	48.92 .22	60.1 0.9	60.12 .11	39.5 0.8	37.06 .26	62.2 1.0	47.54 .10	64.0 0.8
June 9.3	52.13 .11	34.9 0.6	48.70 .22	60.8 0.5	60.01 .11	40.3 0.7	36.80 .26	63.0 0.5	47.44 .10	64.7 0.7
19.3	52.03 .10	34.2 0.7	48.49 .21	61.1 0.1	59.90 .11	40.9 0.6	36.54 .25	63.2 0.1	47.33 .11	65.4 0.7
29.2	51.93 .09	33.5 0.7	48.28 .20	61.0 0.3	59.78 .11	41.4 0.4	36.29 .24	63.1 0.4	47.23 .10	66.0 0.6
July 9.2	51.83 .09	32.9 0.7	48.09 .18	60.5 0.7	59.68 .10	41.8 0.3	36.06 .23	62.5 0.8	47.13 .09	66.6 0.5
19.2	51.75 .08	32.2 0.6	47.92 .16	59.5 1.1	59.58 .09	42.0 0.1	35.84 .21	61.4 1.2	47.03 .09	67.0 0.4
29.1	51.68 .06	31.6 0.6	47.77 .14	58.2 1.5	59.50 .07	42.0 0.1	35.64 .18	60.0 1.6	46.95 .08	67.3 0.3
Aug. 8.1	51.62 .04	31.1 0.5	47.64 .11	56.6 1.8	59.43 .06	41.8 0.3	35.48 .15	58.1 2.0	46.87 .07	67.5 0.1
18.1	51.59 .02	30.7 0.3	47.55 .07	54.6 2.1	59.38 .04	41.5 0.5	35.36 .11	55.9 2.3	46.82 .05	67.6 0.0
28.1	51.57 .00	30.4 0.2	47.49 .03	52.3 2.4	59.36 .01	40.9 0.7	35.27 .06	53.4 2.6	46.78 .02	67.4 0.2
Sept. 7.0	51.59 .03	30.3 0.0	47.48 .01	49.8 2.7	59.36 .01	40.1 0.9	35.23 .01	50.7 2.9	46.77 .01	67.1 0.4
17.0	51.63 .06	30.4 0.2	47.50 .05	47.0 2.9	59.39 .04	39.1 1.1	35.24 .04	47.7 3.1	46.80 .04	66.6 0.6
27.0	51.71 .10	30.8 0.5	47.58 .10	44.0 3.0	59.46 .08	37.8 1.4	35.30 .09	44.5 3.2	46.85 .07	65.8 0.9
Oct. 7.0	51.83 .14	31.3 0.7	47.70 .15	41.0 3.1	59.56 .12	36.3 1.6	35.42 .15	41.2 3.3	46.94 .11	64.8 1.1
16.9	51.98 .17	32.2 1.0	47.88 .21	37.9 3.1	59.70 .16	34.6 1.8	35.61 .21	37.9 3.3	47.07 .15	63.5 1.3
26.9	52.18 .21	33.3 1.3	48.12 .26	34.8 3.0	59.89 .20	32.8 2.0	35.85 .27	34.6 3.2	47.25 .19	62.0 1.6
Nov. 5.9	52.41 .25	34.7 1.5	48.40 .31	31.7 3.0	60.11 .24	30.7 2.1	36.15 .33	31.4 3.1	47.46 .23	60.3 1.8
15.9	52.68 .28	36.3 1.7	48.74 .35	28.8 2.8	60.37 .27	28.5 2.2	36.51 .38	28.4 2.9	47.71 .26	58.4 2.0
25.8	52.97 .30	38.2 1.9	49.11 .39	26.2 2.5	60.66 .30	26.3 2.2	36.91 .42	25.7 2.6	47.99 .29	56.4 2.1
Dec. 5.8	53.29 .32	40.2 2.1	49.52 .42	23.8 2.1	60.98 .32	24.0 2.2	37.36 .46	23.3 2.2	48.30 .31	54.2 2.2
15.8	53.62 .33	42.3 2.1	49.95 .44	21.9 1.7	61.31 .33	21.9 2.1	37.83 .48	21.4 1.7	48.62 .33	52.0 2.1
25.7	53.94 .32	44.4 2.1	50.39 .44	20.4 1.3	61.65 .33	19.8 2.0	38.31 .48	19.9 1.2	48.96 .33	49.9 2.1
35.7	54.26 .31	46.6 2.1	50.82 .43	19.4 0.8	61.98 .32	18.0 1.8	38.79 .47	19.0 0.7	49.28 .31	47.9 2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*o* Virginis.		*ε* Corvi.		4 Draconis (H.)		*γ* Corvi.		2 Can. Venaticorum.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 12 0	° ' + 9 16	h m 12 5	° ' −22 3	h m 12 7	° ' +78 9	h m 12 10	° ' −16 59	h m 12 11	° ' +41 12
	s	"	s	"	s	"	s	"	s	"
Jan. 0.7	8.22 .32	66.5 2.0	0.20 .35	49.7 2.2	32.32 1.18	51.9 0.4	41.03 .33	14.1 2.2	8.21 .39	39.0 1.4
10.7	8.54 .31	64.6 1.8	0.54 .33	52.0 2.4	33.48 1.14	51.8 0.2	41.36 .32	16.4 2.3	8.60 .38	37.8 0.9
20.7	8.84 .29	62.9 1.5	0.85 .30	54.4 2.5	34.59 1.06	52.3 0.8	41.67 .30	18.7 2.3	8.97 .36	37.1 0.4
30.7	9.12 .26	61.5 1.2	1.14 .27	56.9 2.4	35.60 .95	53.5 1.4	41.96 .27	21.0 2.2	9.32 .32	37.0 0.1
Feb. 9.6	9.36 .22	60.4 0.9	1.39 .23	59.3 2.3	36.48 .81	55.2 2.0	42.20 .23	23.2 2.1	9.62 .28	37.3 0.6
19.6	9.55 .18	59.6 0.6	1.59 .19	61.6 2.2	37.21 .64	57.4 2.4	42.41 .19	25.3 2.0	9.87 .23	38.2 1.0
Mar. 1.6	9.71 .13	59.1 0.3	1.76 .14	63.8 2.1	37.76 .45	60.1 2.8	42.58 .14	27.2 1.8	10.07 .17	39.4 1.4
11.5	9.82 .09	59.0 0.0	1.88 .10	65.8 1.9	38.10 .24	63.0 3.0	42.70 .10	28.9 1.6	10.21 .11	41.0 1.7
21.5	9.89 .05	59.1 0.2	1.95 .06	67.6 1.7	38.24 .04	66.0 3.1	42.79 .07	30.4 1.4	10.30 .06	42.9 2.0
31.5	9.92 .01	59.4 0.4	2.00 .02	69.1 1.4	38.18 .16	69.1 3.0	42.83 .03	31.6 1.1	10.33 .01	45.0 2.1
Apr. 10.5	9.92 .02	60.0 0.6	2.00 .01	70.4 1.1	37.93 .34	72.2 2.9	42.84 .00	32.6 0.9	10.31 .04	47.1 2.2
20.4	9.88 .04	60.6 0.7	1.98 .04	71.4 0.9	37.50 .51	75.0 2.7	42.83 .03	33.4 0.6	10.25 .08	49.3 2.1
30.4	9.83 .06	61.4 0.8	1.93 .06	72.2 0.7	36.92 .65	77.5 2.3	42.79 .05	33.9 0.4	10.16 .11	51.3 2.0
May 10.4	9.76 .08	62.3 0.8	1.86 .08	72.8 0.4	36.21 .77	79.6 1.9	42.72 .07	34.3 0.2	10.04 .13	53.2 1.8
20.4	9.67 .09	63.1 0.8	1.77 .09	73.1 0.2	35.40 .85	81.3 1.4	42.65 .08	34.4 0.0	9.89 .15	54.9 1.5
30.3	9.57 .10	63.9 0.8	1.67 .10	73.2 0.1	34.51 .91	82.5 0.9	42.55 .10	34.3 0.2	9.73 .17	56.3 1.2
June 9.3	9.46 .11	64.7 0.7	1.56 .11	73.0 0.3	33.59 .94	83.1 0.4	42.45 .10	34.0 0.4	9.55 .18	57.3 0.9
19.3	9.36 .11	65.4 0.7	1.45 .11	72.6 0.5	32.64 .95	83.2 0.2	42.35 .11	33.6 0.5	9.38 .18	58.0 0.5
29.2	9.25 .11	66.0 0.6	1.33 .12	72.0 0.7	31.70 .92	82.8 0.7	42.24 .11	32.9 0.7	9.20 .18	58.3 0.1
July 9.2	9.15 .10	66.6 0.5	1.22 .12	71.2 0.9	30.80 .88	81.7 1.2	42.12 .11	32.2 0.8	9.03 .17	58.3 0.2
19.2	9.05 .09	67.0 0.3	1.10 .11	70.2 1.1	29.96 .81	80.2 1.8	42.02 .10	31.3 0.9	8.86 .16	57.8 0.6
29.2	8.96 .08	67.2 0.2	1.00 .10	69.1 1.2	29.18 .73	78.2 2.2	41.91 .09	30.3 1.0	8.71 .14	57.0 1.0
Aug. 8.1	8.89 .07	67.3 0.0	0.90 .08	67.8 1.3	28.50 .63	75.8 2.6	41.82 .08	29.2 1.1	8.58 .12	55.8 1.3
18.1	8.82 .05	67.3 0.2	0.83 .06	66.6 1.3	27.92 .52	72.9 3.0	41.75 .06	28.1 1.1	8.47 .09	54.3 1.7
28.1	8.79 .03	67.0 0.4	0.77 .04	65.3 1.3	27.47 .39	69.8 3.3	41.69 .04	27.1 1.0	8.39 .06	52.5 2.0
Sept. 7.1	8.77 .00	66.6 0.6	0.75 .01	64.0 1.2	27.15 .25	66.4 3.5	41.67 .01	26.1 0.9	8.34 .03	50.4 2.3
17.0	8.79 .03	65.9 0.8	0.76 .03	62.8 1.1	26.97 .10	62.7 3.7	41.67 .02	25.2 0.8	8.33 .01	48.0 2.5
27.0	8.84 .07	65.0 1.0	0.80 .07	61.9 0.9	26.94 .06	59.0 3.8	41.71 .06	24.5 0.6	8.36 .05	45.3 2.7
Oct. 7.0	8.92 .11	63.9 1.3	0.90 .11	61.1 0.6	27.08 .22	55.2 3.8	41.79 .10	24.1 0.3	8.44 .10	42.5 2.9
16.9	9.05 .15	62.5 1.5	1.03 .16	60.7 0.3	27.38 .38	51.4 3.7	41.92 .15	23.9 0.0	8.56 .15	39.6 3.0
26.9	9.22 .19	60.9 1.7	1.21 .21	60.6 0.1	27.84 .54	47.7 3.5	42.09 .19	24.0 0.3	8.74 .20	36.6 3.0
Nov. 5.9	9.43 .23	59.1 1.9	1.44 .25	60.8 0.4	28.46 .70	44.3 3.3	42.30 .23	24.5 0.6	8.96 .25	33.5 3.0
15.9	9.68 .26	57.1 2.0	1.70 .28	61.4 0.8	29.23 .84	41.2 3.0	42.56 .27	25.4 1.0	9.24 .30	30.6 2.9
25.8	9.96 .29	55.0 2.1	2.00 .31	62.5 1.2	30.14 .96	38.4 2.5	42.84 .30	26.5 1.3	9.56 .34	27.7 2.7
Dec. 5.8	10.26 .31	52.8 2.2	2.33 .33	63.9 1.5	31.16 1.06	36.1 2.0	43.16 .32	28.0 1.6	9.91 .37	25.1 2.4
15.8	10.59 .33	50.6 2.2	2.67 .35	65.6 1.8	32.26 1.13	34.3 1.4	43.50 .34	29.8 1.9	10.29 .39	22.8 2.1
25.8	10.92 .33	48.5 2.1	3.02 .34	67.6 2.1	33.42 1.16	33.2 0.8	43.84 .34	31.9 2.1	10.69 .40	20.9 1.7
35.7	11.25 .32	46.5 1.9	3.36 .34	69.8 2.3	34.58 1.16	32.7 0.2	44.17 .32	34.0 2.2	11.09 .39	19.4 1.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Chamæleontis.		6 (B) Ursæ Minoris.		η Virginis.		α^1 Crucis.		δ^2 Corvi.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 12 12	° ′ −78 45	h m 12 13	° ′ +88 14	h m 12 14	° ′ − 0 6	h m 12 21	° ′ −62 32	h m 12 24	° ′ −15 57
	s	″	s	″	s	″	s	″	s	″
Jan. 0.7	31.11 1.24	12.3 1.5	83.2 7.2	48.0 0.3	48.61 .33	48.1 2.1	3.62 .60	30.9 1.7	42.58 .34	33.8 2.2
10.7	32.33 1.18	14.0 2.0	90.4 7.1	48.1 0.4	48.94 .32	50.2 2.0	4.20 .57	32.8 2.2	42.91 .33	36.0 2.2
20.7	33.47 1.09	16.3 2.5	97.3 6.7	48.8 1.0	49.24 .29	52.2 1.9	4.76 .53	35.2 2.6	43.23 .30	38.2 2.2
30.7	34.49 .95	19.1 3.0	103.7 6.0	50.1 1.6	49.52 .26	53.9 1.7	5.26 .47	38.0 3.0	43.52 .27	40.5 2.2
Feb. 9.6	35.38 .81	22.3 3.3	109.3 5.2	52.0 2.1	49.77 .23	55.5 1.4	5.69 .40	41.1 3.2	43.78 .24	42.6 2.1
19.6	36.11 .65	25.7 3.6	113.9 4.1	54.3 2.5	49.97 .19	56.8 1.1	6.06 .33	44.5 3.4	44.00 .20	44.6 1.9
Mar. 1.6	36.67 .49	29.4 3.7	117.4 2.9	57.0 2.9	50.14 .15	57.8 0.9	6.36 .26	48.0 3.5	44.18 .16	46.5 1.7
11.5	37.06 .32	33.2 3.8	119.6 1.5	60.1 3.1	50.27 .10	58.5 0.6	6.58 .18	51.5 3.5	44.32 .12	48.1 1.5
21.5	37.29 .15	37.0 3.8	120.4 0.2	63.2 3.2	50.35 .07	59.0 0.3	6.72 .11	55.0 3.5	44.42 .08	49.5 1.3
31.5	37.34 .03	40.8 3.7	119.9 1.2	66.4 3.1	50.40 .03	59.2 0.1	6.80 .04	58.4 3.3	44.48 .04	50.7 1.1
Apr. 10.5	37.23 .19	44.4 3.6	118.1 2.5	69.4 2.9	50.41 .00	59.2 0.1	6.80 .03	61.6 3.1	44.50 .01	51.6 0.8
20.4	36.96 .34	47.9 3.3	115.0 3.6	72.2 2.7	50.40 .03	59.0 0.3	6.74 .09	64.6 2.9	44.50 .02	52.4 0.6
30.4	36.55 .48	51.0 3.0	110.9 4.7	74.8 2.3	50.36 .05	58.6 0.4	6.62 .14	67.4 2.6	44.47 .04	52.9 0.4
May 10.4	36.01 .60	53.8 2.6	105.7 5.5	76.8 1.9	50.30 .07	58.2 0.5	6.45 .19	69.7 2.2	44.42 .06	53.2 0.2
20.4	35.35 .71	56.3 2.2	99.9 6.2	78.5 1.4	50.23 .08	57.6 0.6	6.24 .24	71.7 1.8	44.36 .08	53.2 0.0
30.3	34.60 .80	58.2 1.7	93.4 6.7	79.6 0.8	50.14 .09	57.0 0.6	5.98 .27	73.3 1.4	44.27 .09	53.2 0.2
June 9.3	33.76 .86	59.7 1.2	86.6 6.9	80.1 0.2	50.05 .10	56.4 0.7	5.69 .30	74.4 0.9	44.18 .10	52.9 0.4
19.3	32.87 .91	60.7 0.7	79.6 7.0	80.0 0.3	49.95 .10	55.7 0.7	5.38 .32	75.1 0.4	44.07 .11	52.5 0.5
29.2	31.94 .94	61.1 0.1	72.7 6.9	79.4 0.9	49.84 .10	55.0 0.7	5.05 .33	75.2 0.1	43.96 .11	51.9 0.6
July 9.2	31.00 .93	60.9 0.4	65.9 6.6	78.3 1.4	49.74 .10	54.4 0.6	4.71 .34	74.9 0.6	43.85 .11	51.2 0.8
19.2	30.09 .90	60.2 1.0	59.5 6.2	76.6 1.9	49.64 .10	53.8 0.6	4.38 .33	74.0 1.1	43.74 .11	50.4 0.9
29.2	29.22 .83	59.0 1.5	53.6 5.6	74.4 2.4	49.55 .09	53.2 0.5	4.06 .31	72.8 1.5	43.64 .10	49.4 0.9
Aug. 8.1	28.43 .73	57.3 1.9	48.4 4.9	71.8 2.8	49.46 .08	52.7 0.4	3.77 .27	71.1 1.9	43.54 .09	48.5 1.0
18.1	27.75 .61	55.1 2.3	43.9 4.1	68.8 3.1	49.39 .06	52.3 0.3	3.51 .23	69.0 2.2	43.45 .07	47.5 1.0
28.1	27.21 .46	52.6 2.7	40.3 3.2	65.5 3.4	49.34 .04	52.1 0.2	3.31 .17	66.6 2.5	43.39 .05	46.5 0.9
Sept. 7.1	26.83 .29	49.8 2.9	37.6 2.2	62.0 3.6	49.31 .01	52.0 0.0	3.17 .10	64.0 2.6	43.35 .02	45.6 0.8
17.0	26.64 .09	46.8 3.1	35.8 1.2	58.3 3.8	49.32 .02	52.1 0.2	3.10 .03	61.3 2.7	43.34 .01	44.8 0.7
27.0	26.64 .11	43.7 3.1	35.1 0.2	54.5 3.8	49.35 .05	52.4 0.4	3.12 .06	58.6 2.7	43.37 .05	44.2 0.5
Oct. 7.0	26.86 .32	40.7 2.9	35.5 0.9	50.6 3.8	49.42 .09	53.0 0.7	3.22 .15	55.9 2.6	43.43 .09	43.8 0.3
16.9	27.28 .53	37.8 2.7	36.9 2.0	46.9 3.7	49.54 .14	53.8 1.0	3.42 .24	53.4 2.3	43.54 .13	43.6 0.0
26.9	27.91 .73	35.3 2.4	39.4 3.0	43.2 3.5	49.70 .18	54.9 1.2	3.70 .33	51.3 2.0	43.70 .18	43.8 0.3
Nov. 5.9	28.73 .90	33.1 1.9	42.9 4.0	39.8 3.2	49.90 .22	56.2 1.5	4.07 .41	49.5 1.5	43.90 .22	44.3 0.7
15.9	29.71 1.05	31.4 1.4	47.4 4.9	36.8 2.9	50.13 .26	57.8 1.7	4.52 .48	48.3 1.0	44.14 .26	45.1 1.0
25.8	30.83 1.16	30.2 0.9	52.8 5.8	34.1 2.4	50.41 .29	59.6 1.9	5.03 .54	47.5 0.4	44.42 .29	46.3 1.3
Dec. 5.8	32.04 1.24	29.7 0.2	58.9 6.4	31.9 1.9	50.71 .31	61.6 2.0	5.60 .58	47.4 0.2	44.73 .32	47.8 1.6
15.8	33.30 1.28	29.8 0.4	65.5 6.9	30.3 1.3	51.03 .32	63.7 2.1	6.19 .60	47.8 0.7	45.06 .33	49.5 1.9
25.8	34.59 1.27	30.6 1.1	72.6 7.2	29.3 0.7	51.36 .33	65.9 2.1	6.79 .60	48.9 1.3	45.40 .34	51.5 2.1
35.7	35.84 1.21	31.9 1.7	79.8 7.2	29.0 0.0	51.68 .32	68.0 2.1	7.39 .58	50.5 1.9	45.74 .33	53.6 2.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Can. Ven.		β Corvi.		κ Draconis.		γ Virginis (mean).		31 Com. Berenices.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 12 29	° ′ +41 53	h m 12 29	° ′ −22 50	h m 12 29	° ′ +70 19	h m 12 36	° ′ − 0 54	h m 12 46	° ′ +28 4
	s	″	s	″	s	″	s	″	s	″
Jan. 0.7	0.74 .39	41.7 1.6	9.17 .36	37.5 2.1	13.72 .75	55.7 1.0	36.72 .33	11.1 2.1	50.59 .36	48.2 2.0
10.7	1.13 .39	40.3 1.1	9.52 .34	39.7 2.3	14.47 .74	55.0 0.3	37.04 .32	13.2 2.0	50.94 .35	46.4 1.6
20.7	1.51 .37	39.5 0.5	9.85 .32	42.1 2.4	15.20 .71	55.0 0.3	37.35 .30	15.2 1.9	51.28 .33	45.0 1.1
30.7	1.86 .34	39.2 0.0	10.16 .29	44.4 2.4	15.87 .65	55.7 1.0	37.64 .27	17.0 1.7	51.61 .31	44.1 0.7
Feb. 9.6	2.18 .29	39.5 0.5	10.42 .25	46.8 2.3	16.48 .57	57.0 1.6	37.90 .24	18.5 1.4	51.90 .27	43.7 0.2
19.6	2.45 .24	40.2 1.0	10.66 .21	49.0 2.2	16.99 .47	58.8 2.1	38.12 .20	19.8 1.2	52.15 .23	43.7 0.2
Mar. 1.6	2.67 .19	41.4 1.4	10.84 .17	51.2 2.1	17.40 .35	61.1 2.5	38.30 .16	20.9 0.9	52.36 .19	44.2 0.6
11.6	2.83 .13	43.0 1.8	10.99 .13	53.2 1.9	17.69 .23	63.7 2.8	38.45 .13	21.6 0.6	52.53 .14	45.0 1.0
21.5	2.94 .08	45.0 2.0	11.10 .09	55.0 1.7	17.86 .11	66.6 3.0	38.56 .09	22.2 0.4	52.65 .10	46.2 1.3
31.5	2.99 .03	47.1 2.2	11.16 .05	56.6 1.5	17.90 .01	69.6 3.0	38.62 .05	22.4 0.1	52.73 .06	47.6 1.5
Apr. 10.5	2.99 .02	49.3 2.2	11.20 .02	57.9 1.2	17.83 .13	72.6 3.0	38.66 .02	22.4 0.1	52.76 .02	49.3 1.7
20.4	2.95 .06	51.6 2.2	11.20 .01	59.0 1.0	17.65 .23	75.6 2.8	38.67 .01	22.2 0.2	52.76 .02	51.0 1.8
30.4	2.87 .10	53.8 2.1	11.18 .04	59.9 0.8	17.37 .32	78.2 2.5	38.65 .03	21.9 0.4	52.73 .05	52.8 1.7
May 10.4	2.76 .12	55.8 1.9	11.13 .06	60.5 0.5	17.01 .39	80.6 2.2	38.61 .05	21.5 0.5	52.67 .07	54.5 1.7
20.4	2.62 .14	57.6 1.7	11.06 .08	60.9 0.3	16.58 .45	82.6 1.8	38.55 .07	20.9 0.6	52.58 .09	56.1 1.6
30.3	2.46 .16	59.2 1.4	10.97 .09	61.1 0.1	16.11 .50	84.2 1.3	38.48 .08	20.3 0.6	52.48 .11	57.6 1.4
June 9.3	2.29 .18	60.4 1.0	10.87 .10	61.0 0.2	15.59 .53	85.2 0.8	38.39 .09	19.7 0.7	52.36 .12	58.8 1.1
19.3	2.11 .18	61.3 0.7	10.76 .11	60.8 0.4	15.06 .54	85.7 0.3	38.30 .10	19.0 0.7	52.24 .13	59.9 0.9
29.3	1.93 .18	61.8 0.3	10.65 .12	60.3 0.6	14.52 .54	85.7 0.3	38.19 .11	18.3 0.7	52.10 .14	60.6 0.6
July 9.2	1.74 .18	61.9 0.1	10.53 .12	59.6 0.8	13.99 .52	85.2 0.8	38.08 .11	17.6 0.6	51.96 .14	61.1 0.3
19.2	1.56 .17	61.6 0.5	10.41 .12	58.7 1.0	13.48 .49	84.1 1.3	37.98 .11	17.0 0.6	51.82 .14	61.3 0.0
29.2	1.40 .16	60.9 0.9	10.29 .11	57.7 1.1	13.00 .45	82.6 1.8	37.87 .10	16.4 0.5	51.69 .13	61.1 0.3
Aug. 8.1	1.24 .14	59.8 1.2	10.18 .10	56.6 1.2	12.57 .41	80.6 2.2	37.77 .09	15.9 0.5	51.56 .12	60.7 0.6
18.1	1.11 .12	58.4 1.6	10.09 .08	55.4 1.2	12.19 .35	78.2 2.6	37.68 .08	15.5 0.3	51.45 .10	59.9 0.9
28.1	1.01 .09	56.6 1.9	10.02 .06	54.1 1.2	11.88 .28	75.4 3.0	37.61 .06	15.2 0.2	51.35 .08	58.8 1.2
Sept. 7.1	0.93 .06	54.5 2.2	9.97 .03	52.9 1.2	11.64 .20	72.2 3.3	37.56 .03	15.1 0.0	51.28 .06	57.5 1.5
17.0	0.89 .02	52.2 2.5	9.95 .00	51.7 1.1	11.48 .11	68.8 3.5	37.54 .00	15.2 0.2	51.24 .03	55.8 1.8
27.0	0.89 .02	49.5 2.7	9.97 .04	50.7 0.9	11.42 .02	65.2 3.7	37.56 .03	15.4 0.4	51.23 .01	53.9 2.0
Oct. 7.0	0.94 .07	46.7 2.9	10.04 .09	49.9 0.7	11.45 .08	61.5 3.7	37.61 .07	15.9 0.6	51.26 .05	51.8 2.3
17.0	1.04 .12	43.7 3.0	10.15 .13	49.3 0.4	11.59 .19	57.8 3.7	37.70 .12	16.7 0.9	51.34 .10	49.4 2.5
26.9	1.19 .18	40.6 3.1	10.31 .18	49.1 0.1	11.83 .29	54.1 3.7	37.84 .16	17.7 1.2	51.46 .15	46.8 2.6
Nov. 5.9	1.39 .23	37.5 3.1	10.51 .23	49.2 0.3	12.17 .40	50.5 3.5	38.02 .20	19.0 1.4	51.63 .19	44.1 2.7
15.9	1.65 .28	34.5 3.0	10.76 .27	49.6 0.6	12.62 .50	47.1 3.2	38.24 .24	20.5 1.6	51.85 .24	41.4 2.8
25.8	1.95 .32	31.5 2.8	11.05 .30	50.5 1.0	13.16 .58	44.1 2.9	38.50 .28	22.2 1.8	52.11 .28	38.6 2.7
Dec. 5.8	2.29 .36	28.8 2.6	11.37 .33	51.7 1.4	13.78 .65	41.4 2.5	38.79 .30	24.2 2.0	52.40 .31	36.0 2.6
15.8	2.66 .38	26.3 2.3	11.71 .34	53.2 1.7	14.47 .71	39.2 1.9	39.11 .32	26.2 2.1	52.73 .34	33.4 2.4
25.8	3.05 .39	24.3 1.8	12.06 .35	55.1 2.0	15.20 .74	37.6 1.3	39.43 .33	28.3 2.1	53.07 .35	31.1 2.1
35.7	3.45 .40	22.6 1.4	12.41 .35	57.1 2.2	15.94 .75	36.6 0.7	39.76 .33	30.4 2.1	53.43 .36	29.2 1.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	32^2 Camelop. (H.)		α Can. Ven.		δ Muscæ.		ε Virginis.		θ Virginis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 12 48	° ′ +83 56	h m 12 51	° ′ +38 50	h m 12 55	° ′ −71 0	h m 12 57	° ′ +11 29	h m 13 4	° ′ − 5 0
	s	″	s	″	s	″	s	″	s	″
Jan. 0.8	21.46 2.14	56.6 0.8	21.84 .38	70.0 1.9	24.77 .82	21.8 1.1	12.86 .33	36.0 2.0	47.24 .33	24.3 2.1
10.7	23.60 2.14	56.0 0.2	22.23 .38	68.4 1.4	25.59 .81	23.1 1.6	13.19 .33	34.0 1.9	47.57 .33	26.4 2.0
20.7	25.72 2.08	56.2 0.4	22.60 .36	67.3 0.8	26.38 .77	25.0 2.1	13.51 .31	32.2 1.6	47.89 .31	28.4 1.9
30.7	27.74 1.94	56.9 1.1	22.96 .34	66.7 0.3	27.12 .71	27.3 2.5	13.81 .29	30.8 1.3	48.19 .29	30.3 1.8
Feb. 9.7	29.58 1.73	58.3 1.7	23.28 .30	66.6 0.2	27.79 .63	30.0 2.9	14.09 .26	29.6 1.0	48.47 .26	32.0 1.6
19.6	31.18 1.46	60.3 2.2	23.56 .26	67.1 0.7	28.38 .54	33.1 3.2	14.33 .22	28.9 0.6	48.72 .23	33.5 1.4
Mar. 1.6	32.47 1.13	62.7 2.6	23.80 .21	68.0 1.2	28.88 .45	36.4 3.4	14.54 .19	28.4 0.2	48.93 .19	34.7 1.1
11.6	33.42 .77	65.5 2.9	23.98 .16	69.4 1.5	29.28 .35	39.9 3.5	14.70 .15	28.4 0.1	49.10 .15	35.7 0.8
21.5	34.00 .38	68.5 3.1	24.11 .11	71.1 1.8	29.58 .25	43.4 3.6	14.83 .11	28.6 0.4	49.24 .12	36.4 0.6
31.5	34.18 .01	71.7 3.2	24.19 .06	73.1 2.1	29.78 .15	47.0 3.5	14.92 .07	29.1 0.6	49.34 .08	36.9 0.4
Apr. 10.5	33.98 .39	74.8 3.1	24.23 .01	75.3 2.2	29.88 .05	50.5 3.4	14.97 .04	29.9 0.8	49.40 .05	37.1 0.1
20.5	33.41 .75	77.9 2.9	24.22 .03	77.5 2.2	29.89 .04	53.9 3.2	15.00 .01	30.8 1.0	49.44 .02	37.2 0.0
30.4	32.50 1.07	80.7 2.6	24.18 .06	79.7 2.2	29.80 .13	57.0 3.0	14.99 .02	31.8 1.1	49.45 .00	37.0 0.2
May 10.4	31.28 1.36	83.2 2.3	24.09 .09	81.8 2.0	29.64 .21	59.9 2.7	14.96 .04	32.9 1.1	49.44 .03	36.7 0.3
20.4	29.81 1.58	85.2 1.8	23.98 .12	83.7 1.8	29.38 .29	62.4 2.4	14.90 .06	34.0 1.1	49.40 .05	36.3 0.4
30.4	28.14 1.76	86.8 1.3	23.85 .14	85.4 1.6	29.06 .35	64.6 1.9	14.83 .08	35.1 1.0	49.34 .06	35.8 0.5
June 9.3	26.31 1.89	87.9 0.8	23.70 .16	86.8 1.2	28.68 .41	66.3 1.5	14.74 .09	36.1 1.0	49.27 .08	35.3 0.6
19.3	24.38 1.96	88.4 0.2	23.54 .17	87.9 0.9	28.24 .46	67.5 1.0	14.65 .10	37.0 0.9	49.18 .09	34.7 0.6
29.3	22.41 1.98	88.4 0.3	23.37 .17	88.6 0.6	27.76 .49	68.3 0.5	14.54 .11	37.8 0.7	49.08 .10	34.0 0.7
July 9.2	20.44 1.95	87.8 0.9	23.20 .17	89.0 0.2	27.26 .51	68.5 0.0	14.43 .12	38.4 0.6	48.98 .11	33.4 0.7
19.2	18.52 1.86	86.7 1.4	23.02 .17	89.0 0.2	26.74 .51	68.2 0.6	14.31 .12	39.0 0.4	48.87 .11	32.7 0.6
29.2	16.70 1.76	85.0 1.9	22.85 .16	88.6 0.6	26.23 .50	67.4 1.1	14.19 .11	39.3 0.2	48.75 .11	32.1 0.6
Aug. 8.2	15.01 1.61	82.9 2.3	22.69 .15	87.8 1.0	25.74 .47	66.1 1.5	14.08 .11	39.4 0.0	48.64 .11	31.5 0.6
18.1	13.50 1.42	80.4 2.7	22.55 .13	86.6 1.3	25.30 .42	64.4 2.0	13.98 .09	39.4 0.2	48.54 .10	30.9 0.5
28.1	12.19 1.19	77.4 3.1	22.43 .11	85.1 1.7	24.91 .34	62.2 2.3	13.89 .08	39.1 0.4	48.45 .08	30.5 0.4
Sept. 7.1	11.12 .94	74.1 3.4	22.33 .08	83.2 2.0	24.61 .25	59.7 2.6	13.82 .06	38.6 0.6	48.38 .06	30.2 0.2
17.1	10.31 .67	70.6 3.6	22.27 .04	81.1 2.3	24.40 .15	57.0 2.8	13.78 .03	37.9 0.9	48.34 .03	30.0 0.1
27.0	9.79 .37	66.9 3.8	22.25 .00	78.7 2.6	24.31 .03	54.1 2.9	13.77 .01	36.9 1.1	48.32 .01	30.0 0.1
Oct. 7.0	9.57 .06	63.1 3.8	22.26 .04	76.0 2.8	24.34 .10	51.2 2.9	13.80 .05	35.7 1.4	48.35 .04	30.2 0.3
17.0	9.66 .26	59.3 3.8	22.33 .09	73.1 2.9	24.50 .23	48.4 2.7	13.87 .09	34.2 1.6	48.41 .09	30.7 0.6
26.9	10.08 .58	55.5 3.7	22.45 .15	70.1 3.0	24.79 .35	45.8 2.5	13.98 .13	32.5 1.8	48.52 .13	31.4 0.9
Nov. 5.9	10.83 .91	51.8 3.5	22.62 .20	67.0 3.1	25.21 .48	43.4 2.1	14.14 .18	30.6 2.0	48.68 .18	32.4 1.1
15.9	11.89 1.22	48.4 3.2	22.85 .25	63.9 3.1	25.74 .59	41.5 1.7	14.34 .22	28.5 2.2	48.88 .22	33.7 1.4
25.9	13.25 1.50	45.4 2.9	23.12 .29	60.9 2.9	26.38 .68	40.1 1.1	14.58 .26	26.2 2.3	49.12 .26	35.2 1.6
Dec. 5.8	14.88 1.74	42.7 2.4	23.44 .33	58.0 2.7	27.11 .75	39.3 0.6	14.86 .29	24.0 2.3	49.40 .29	36.9 1.8
15.8	16.72 1.94	40.6 1.9	23.78 .36	55.4 2.4	27.89 .80	39.0 0.0	15.16 .31	21.6 2.3	49.71 .31	38.8 2.0
25.8	18.74 2.08	39.0 1.3	24.16 .38	53.1 2.1	28.70 .82	39.3 0.6	15.48 .33	19.4 2.2	50.03 .33	40.8 2.0
35.8	20.85 2.15	38.1 0.7	24.54 .39	51.2 1.8	29.53 .82	40.3 1.1	15.81 .33	17.3 2.0	50.36 .33	42.8 2.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	20 Can. Ven.		α Virginis. (*Spica.*)		κ Octantis.		ζ Virginis.		B. A. C. 4536.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	13 13	+41 5	13 19	−10 38	13 24	−85 16	13 29	− 0 5	13 30	+37 41
	s	″	s	″	s	″	s	″	s	″
Jan. 0.8	4.17 .39	36.4 2.0	56.32 .34	25.2 2.0	43.57 2.99	10.6 0.2	36.59 .33	11.7 2.1	20.42 .37	22.1 2.2
10.8	4.56 .39	34.7 1.5	56.66 .33	27.2 2.0	46.56 2.99	11.2 0.8	36.92 .33	13.8 2.0	20.79 .38	20.1 1.7
20.7	4.95 .38	33.4 1.0	56.99 .32	29.2 2.0	49.52 2.90	12.3 1.4	37.25 .32	15.7 1.8	21.17 .37	18.6 1.2
30.7	5.32 .36	32.7 0.4	57.30 .30	31.2 1.9	52.34 2.74	14.0 2.0	37.56 .30	17.4 1.7	21.53 .35	17.7 0.7
Feb. 9.7	5.66 .32	32.6 0.1	57.59 .27	33.0 1.7	54.98 2.52	16.2 2.5	37.85 .28	19.0 1.4	21.87 .32	17.3 0.1
19.6	5.97 .28	33.0 0.7	57.85 .24	34.6 1.6	57.38 2.25	18.9 2.9	38.11 .25	20.3 1.1	22.17 .29	17.5 0.4
Mar. 1.6	6.23 .24	33.9 1.2	58.07 .21	36.1 1.4	59.47 1.90	21.9 3.2	38.34 .21	21.2 0.8	22.44 .25	18.1 0.9
11.6	6.44 .19	35.3 1.6	58.26 .17	37.4 1.1	61.23 1.58	25.2 3.4	38.53 .18	21.9 0.6	22.66 .20	19.3 1.4
21.6	6.60 .14	37.0 1.9	58.42 .14	38.4 0.9	62.63 1.21	28.7 3.6	38.69 .14	22.4 0.3	22.84 .15	20.8 1.7
31.6	6.71 .08	39.1 2.2	58.53 .10	39.1 0.7	63.65 .82	32.4 3.7	38.81 .10	22.5 0.0	22.97 .11	22.7 2.0
Apr. 10.5	6.77 .04	41.4 2.3	58.62 .07	39.7 0.5	64.27 .43	36.1 3.7	38.90 .07	22.4 0.2	23.05 .06	24.8 2.2
20.5	6.79 .01	43.7 2.4	58.67 .04	40.1 0.3	64.50 .03	39.8 3.6	38.96 .04	22.1 0.4	23.09 .02	27.1 2.3
30.5	6.76 .05	46.1 2.3	58.70 .01	40.2 0.1	64.34 .36	43.3 3.5	38.99 .02	21.7 0.5	23.09 .02	29.4 2.3
May 10.4	6.70 .08	48.4 2.2	58.70 .01	40.3 0.1	63.79 .74	46.7 3.3	38.99 .01	21.1 0.6	23.06 .05	31.7 2.2
20.4	6.60 .11	50.5 2.0	58.67 .03	40.1 0.2	62.88 1.09	49.8 3.0	38.97 .03	20.4 0.7	22.98 .09	33.9 2.1
30.4	6.47 .14	52.4 1.8	58.63 .05	39.9 0.3	61.62 1.42	52.6 2.6	38.93 .05	19.7 0.8	22.88 .11	35.9 1.9
June 9.3	6.33 .16	54.1 1.5	58.56 .07	39.5 0.4	60.06 1.71	55.0 2.2	38.87 .07	19.0 0.8	22.76 .13	37.6 1.6
19.3	6.16 .17	55.4 1.1	58.48 .09	39.0 0.5	58.22 1.95	57.0 1.7	38.79 .09	18.2 0.8	22.62 .15	39.0 1.3
29.3	5.98 .18	56.3 0.7	58.39 .10	38.5 0.6	56.17 2.16	58.4 1.1	38.70 .10	17.4 0.7	22.46 .17	40.1 0.9
July 9.3	5.80 .19	56.8 0.3	58.28 .11	37.9 0.6	53.96 2.27	59.4 0.6	38.59 .11	16.7 0.7	22.29 .18	40.8 0.5
19.2	5.61 .19	56.9 0.1	58.17 .12	37.2 0.7	51.65 2.33	59.7 0.1	38.48 .12	16.1 0.6	22.11 .18	41.2 0.1
29.2	5.42 .19	56.7 0.5	58.05 .12	36.5 0.7	49.32 2.31	59.5 0.5	38.36 .12	15.5 0.5	21.93 .18	41.2 0.3
Aug. 8.2	5.24 .18	56.0 0.9	57.93 .12	35.8 0.7	47.05 2.22	58.8 1.0	38.24 .12	15.0 0.4	21.75 .18	40.7 0.6
18.2	5.07 .16	54.9 1.3	57.82 .11	35.2 0.7	44.91 2.04	57.4 1.6	38.12 .11	14.6 0.3	21.58 .17	39.9 1.0
28.1	4.91 .14	53.4 1.6	57.72 .09	34.5 0.6	42.99 1.79	55.6 2.1	38.02 .10	14.4 0.2	21.42 .15	38.7 1.4
Sept. 7.1	4.79 .11	51.6 2.0	57.63 .07	33.9 0.5	41.36 1.45	53.3 2.5	37.93 .08	14.3 0.0	21.28 .12	37.1 1.7
17.1	4.69 .08	49.4 2.3	57.57 .04	33.4 0.4	40.10 1.06	50.7 2.8	37.86 .05	14.4 0.2	21.18 .09	35.2 2.1
27.0	4.63 .04	47.0 2.6	57.55 .01	33.1 0.2	39.26 .61	47.8 3.0	37.82 .02	14.7 0.4	21.10 .05	32.9 2.4
Oct. 7.0	4.62 .01	44.3 2.8	57.56 .03	33.0 0.0	38.90 .12	44.6 3.1	37.82 .02	15.2 0.6	21.08 .01	30.4 2.7
17.0	4.66 .06	41.3 3.0	57.61 .08	33.1 0.2	39.03 .39	41.5 3.1	37.86 .06	15.9 0.9	21.09 .04	27.6 2.9
27.0	4.75 .12	38.2 3.2	57.71 .12	33.5 0.5	39.67 .90	38.4 3.0	37.94 .11	16.9 1.1	21.16 .09	24.7 3.0
Nov. 5.9	4.89 .17	35.0 3.2	57.85 .17	34.1 0.8	40.82 1.39	35.6 2.7	38.07 .15	18.1 1.4	21.28 .15	21.6 3.1
15.9	5.10 .23	31.8 3.2	58.05 .21	35.0 1.1	42.44 1.84	33.0 2.4	38.25 .20	19.6 1.6	21.46 .20	18.4 3.2
25.9	5.35 .28	28.6 3.1	58.28 .25	36.2 1.3	44.48 2.23	30.8 1.9	38.47 .24	21.3 1.8	21.69 .25	15.3 3.1
Dec. 5.9	5.65 .32	25.6 2.9	58.56 .29	37.6 1.5	46.88 2.55	29.2 1.4	38.73 .27	23.1 1.9	21.96 .30	12.2 3.0
15.8	5.99 .35	22.8 2.6	58.86 .31	39.3 1.8	49.56 2.79	28.0 0.8	39.02 .30	25.1 2.0	22.28 .33	9.4 2.7
25.8	6.36 .38	20.4 2.2	59.18 .33	41.1 1.9	52.42 2.93	27.6 0.2	39.33 .32	27.2 2.1	22.63 .36	6.8 2.4
35.8	6.74 .39	18.4 1.8	59.51 .33	43.1 2.0	55.39 2.99	27.7 0.5	39.65 .32	29.2 2.0	22.99 .37	4.6 2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*m* Virginis.		η Ursæ Majoris.		η Bootis.		θ Apodis.		β Centauri.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 13 36	° ′ − 8 11	h m 13 43	° ′ +49 48	h m 13 49	° ′ +18 53	h m 13 55	° ′ −76 18	h m 13 56	° ′ −59 53
	s	″	s	″	s	″	s	″	s	″
Jan. 0.8	22.53 .33	58.4 1.9	36.17 .42	23.0 2.2	55.92 .33	43.3 2.3	35.09 1.11	37.2 0.0	46.61 .57	15.0 0.5
10.8	22.86 .33	60.4 2.0	36.60 .43	21.1 1.7	56.26 .33	41.1 2.0	36.21 1.13	37.5 0.6	47.19 .58	15.8 1.0
20.8	23.19 .32	62.3 1.9	37.03 .43	19.7 1.1	56.59 .33	39.3 1.7	37.34 1.12	38.4 1.1	47.77 .57	17.0 1.4
30.7	23.50 .31	64.2 1.8	37.45 .41	18.9 0.5	56.91 .32	37.8 1.3	38.43 1.07	39.8 1.7	48.34 .55	18.6 1.8
Feb. 9.7	23.80 .28	65.9 1.6	37.85 .39	18.8 0.2	57.22 .30	36.7 0.9	39.48 1.01	41.7 2.1	48.87 .52	20.6 2.2
19.7	24.07 .26	67.4 1.4	38.22 .35	19.2 0.8	57.50 .27	36.1 0.4	40.45 .92	44.0 2.5	49.36 .47	22.9 2.5
Mar. 1.6	24.30 .22	68.8 1.2	38.54 .30	20.3 1.3	57.75 .23	35.9 0.0	41.33 .82	46.7 2.9	49.81 .42	25.6 2.7
11.6	24.51 .18	69.9 1.0	38.82 .25	21.8 1.8	57.97 .20	36.1 0.4	42.09 .71	49.7 3.1	50.21 .36	28.3 2.9
21.6	24.67 .15	70.7 0.7	39.04 .19	23.8 2.2	58.14 .16	36.7 0.8	42.74 .59	52.9 3.3	50.54 .30	31.3 3.0
31.6	24.81 .12	71.3 0.5	39.20 .13	26.2 2.5	58.29 .12	37.6 1.1	43.27 .46	56.3 3.4	50.82 .24	34.2 3.0
Apr. 10.5	24.91 .08	71.7 0.3	39.30 .07	28.8 2.7	58.39 .09	38.8 1.3	43.66 .33	59.7 3.4	51.03 .18	37.2 3.0
20.5	24.98 .05	71.9 0.1	39.34 .02	31.5 2.8	58.46 .05	40.2 1.5	43.92 .19	63.2 3.4	51.18 .12	40.1 2.9
30.5	25.02 .03	71.9 0.1	39.34 .03	34.2 2.7	58.50 .02	41.7 1.6	44.05 .06	66.5 3.3	51.28 .06	42.9 2.7
May 10.5	25.03 .00	71.8 0.2	39.28 .08	36.9 2.6	58.51 .01	43.3 1.6	44.04 .07	69.7 3.1	51.31 .00	45.5 2.5
20.4	25.02 .02	71.5 0.3	39.18 .12	39.4 2.4	58.49 .03	44.9 1.6	43.90 .20	72.7 2.9	51.29 .05	47.9 2.3
30.4	24.99 .04	71.1 0.4	39.04 .15	41.7 2.1	58.45 .06	46.5 1.5	43.63 .32	75.5 2.6	51.21 .11	50.0 2.0
June 9.4	24.93 .06	70.6 0.5	38.88 .18	43.7 1.8	58.38 .08	47.9 1.4	43.25 .44	77.9 2.2	51.08 .16	51.9 1.6
19.3	24.86 .08	70.1 0.6	38.68 .21	45.3 1.4	58.29 .10	49.2 1.2	42.76 .54	79.9 1.8	50.89 .20	53.3 1.3
29.3	24.77 .10	69.5 0.6	38.46 .23	46.5 1.0	58.19 .11	50.3 1.0	42.18 .62	81.4 1.3	50.67 .24	54.4 0.9
July 9.3	24.67 .11	68.9 0.6	38.22 .24	47.3 0.5	58.07 .13	51.2 0.8	41.52 .69	82.5 0.8	50.41 .28	55.0 0.4
19.3	24.56 .12	68.3 0.6	37.97 .25	47.6 0.1	57.94 .14	51.9 0.5	40.80 .73	83.1 0.3	50.12 .30	55.2 0.0
29.2	24.43 .12	67.6 0.6	37.72 .25	47.4 0.4	57.80 .14	52.3 0.3	40.06 .75	83.1 0.2	49.81 .31	55.0 0.5
Aug. 8.2	24.31 .12	67.0 0.6	37.47 .25	46.8 0.9	57.66 .14	52.4 0.0	39.30 .75	82.6 0.8	49.50 .31	54.3 0.6
18.2	24.19 .12	66.4 0.6	37.23 .23	45.7 1.3	57.52 .14	52.3 0.3	38.56 .72	81.5 1.3	49.18 .30	53.2 1.3
28.2	24.08 .10	65.8 0.5	37.00 .21	44.2 1.7	57.39 .12	51.9 0.5	37.88 .65	80.0 1.8	48.89 .28	51.7 1.7
Sept. 7.1	23.99 .08	65.4 0.4	36.81 .18	42.3 2.1	57.27 .11	51.2 0.8	37.27 .56	78.0 2.2	48.64 .24	49.8 2.0
17.1	23.91 .06	65.0 0.2	36.64 .15	40.0 2.5	57.18 .08	50.2 1.1	36.77 .43	75.6 2.5	48.42 .18	47.7 2.3
27.1	23.87 .03	64.9 0.1	36.52 .10	37.3 2.8	57.11 .05	48.9 1.4	36.40 .29	72.9 2.8	48.28 .12	45.3 2.4
Oct. 7.0	23.86 .01	64.9 0.1	36.44 .05	34.4 3.1	57.08 .01	47.4 1.7	36.19 .12	70.0 2.9	48.20 .04	42.8 2.5
17.0	23.90 .06	65.1 0.3	36.42 .01	31.2 3.3	57.08 .03	45.6 1.9	36.15 .05	67.1 3.0	48.20 .05	40.4 2.5
27.0	23.98 .11	65.6 0.6	36.46 .07	27.8 3.4	57.14 .08	43.5 2.1	36.30 .24	64.1 2.9	48.30 .14	38.0 2.3
Nov. 6.0	24.11 .15	66.3 0.9	36.56 .14	24.3 3.5	57.24 .13	41.2 2.3	36.63 .42	61.3 2.7	48.48 .23	35.7 2.1
15.9	24.28 .20	67.3 1.1	36.73 .20	20.8 3.5	57.39 .18	38.8 2.5	37.14 .59	58.7 2.4	48.76 .32	33.8 1.8
25.9	24.50 .24	68.6 1.4	36.96 .26	17.3 3.4	57.59 .22	36.3 2.6	37.81 .75	56.5 2.0	49.12 .40	32.2 1.4
Dec. 5.9	24.76 .28	70.1 1.6	37.26 .32	14.0 3.2	57.83 .26	33.7 2.6	38.64 .89	54.8 1.5	49.55 .47	31.1 0.9
15.8	25.06 .31	71.8 1.8	37.60 .37	11.0 2.9	58.10 .29	31.1 2.5	39.58 .99	53.5 1.0	50.04 .52	30.4 0.4
25.8	25.37 .32	73.6 1.9	37.98 .40	8.4 2.5	58.41 .32	28.6 2.4	40.61 1.07	52.8 0.4	50.58 .56	30.3 0.1
35.8	25.70 .33	75.5 2.0	38.40 .42	6.1 2.0	58.74 .33	26.3 2.2	41.70 1.11	52.7 0.2	51.15 .57	30.7 0.6

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	π Hydræ.		α Draconis.		*d* Bootis.		κ Virginis.		4 Ursæ Minoris.	
	Right Ascension.	Declination *South*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *North*.	Right Ascension.	Declination *South*.	Right Ascension.	Declination *North*.
	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	14 0	−26 12	14 1	+64 50	14 5	+25 33	14 7	− 9 48	14 9	+78 0
	s	″	s	″	s	″	s	″	s	″
Jan. 0.8	41.23 .36	0.3 1.4	40.12 .55	50.6 2.2	50.75 .33	40.6 2.4	34.24 .33	32.9 1.8	10.82 .99	39.0 2.1
10.8	41.60 .36	1.8 1.7	40.69 .58	48.7 1.6	51.09 .34	38.4 2.1	34.57 .33	34.7 1.8	11.85 1.07	37.2 1.5
20.8	41.96 .36	3.6 1.8	41.29 .60	47.4 1.0	51.43 .34	36.6 1.7	34.90 .33	36.5 1.8	12.94 1.11	36.1 0.8
30.7	42.31 .34	5.4 1.9	41.88 .59	46.8 0.3	51.76 .33	35.1 1.2	35.23 .32	38.3 1.7	14.06 1.11	35.7 0.1
Feb. 9.7	42.64 .32	7.3 1.9	42.45 .56	46.9 0.4	52.08 .31	34.1 0.7	35.54 .30	40.0 1.6	15.14 1.07	35.9 0.6
19.7	42.94 .29	9.2 1.9	42.99 .51	47.6 1.0	52.38 .28	33.7 0.2	35.82 .27	41.5 1.4	16.17 .98	36.8 1.2
Mar. 1.7	43.22 .26	11.1 1.8	43.47 .45	48.9 1.6	52.65 .25	33.7 0.2	36.08 .24	42.8 1.2	17.10 .87	38.3 1.8
11.6	43.46 .23	12.9 1.7	43.88 .37	50.8 2.1	52.88 .22	34.1 0.7	36.31 .21	43.9 1.0	17.90 .72	40.4 2.3
21.6	43.67 .19	14.5 1.6	44.21 .29	53.1 2.5	53.08 .18	35.0 1.1	36.51 .18	44.7 0.7	18.54 .56	42.9 2.7
31.6	43.85 .16	16.1 1.5	44.45 .20	55.8 2.8	53.24 .14	36.3 1.4	36.67 .15	45.3 0.5	19.01 .38	45.8 3.0
Apr. 10.5	43.99 .12	17.4 1.3	44.61 .11	58.8 3.0	53.36 .10	37.8 1.7	36.81 .12	45.8 0.3	19.29 .19	48.9 3.2
20.5	44.09 .09	18.7 1.1	44.68 .03	61.8 3.1	53.45 .07	39.6 1.8	36.91 .09	46.0 0.1	19.39 .00	52.1 3.2
30.5	44.17 .06	19.7 1.0	44.66 .06	65.0 3.1	53.50 .03	41.5 1.9	36.98 .06	46.0 0.0	19.29 .18	55.3 3.2
May 10.5	44.21 .03	20.6 0.8	44.56 .14	68.0 2.9	53.52 .00	43.4 2.0	37.03 .03	45.9 0.2	19.02 .35	58.4 3.0
20.4	44.23 .00	21.3 0.6	44.38 .21	70.8 2.7	53.50 .03	45.4 1.9	37.04 .00	45.7 0.3	18.59 .51	61.2 2.7
30.4	44.21 .03	21.8 0.4	44.14 .27	73.3 2.4	53.46 .06	47.2 1.8	37.04 .02	45.4 0.4	18.01 .65	63.7 2.4
June 9.4	44.17 .05	22.2 0.2	43.84 .32	75.5 2.0	53.39 .08	49.0 1.6	37.00 .04	44.9 0.5	17.30 .77	65.9 2.0
19.4	44.10 .08	22.3 0.1	43.50 .37	77.3 1.5	53.30 .10	50.5 1.4	36.95 .06	44.4 0.5	16.48 .86	67.6 1.5
29.3	44.02 .10	22.3 0.1	43.11 .41	78.6 1.0	53.19 .12	51.8 1.2	36.87 .08	43.9 0.6	15.58 .93	68.8 1.0
July 9.3	43.91 .12	22.1 0.3	42.69 .43	79.4 0.5	53.06 .14	52.8 0.9	36.78 .10	43.4 0.6	14.62 .98	69.5 0.4
19.3	43.78 .13	21.7 0.5	42.26 .44	79.7 0.0	52.92 .15	53.6 0.6	36.67 .12	42.8 0.6	13.62 1.01	69.7 0.1
29.2	43.64 .14	21.1 0.7	41.81 .44	79.5 0.5	52.76 .16	54.0 0.3	36.54 .13	42.1 0.6	12.60 1.01	69.3 0.7
Aug. 8.2	43.49 .15	20.4 0.8	41.37 .44	78.7 1.0	52.60 .16	54.1 0.1	36.41 .13	41.5 0.6	11.60 .99	68.4 1.2
18.2	43.35 .14	19.5 0.9	40.94 .42	77.5 1.5	52.44 .16	53.9 0.4	36.28 .13	40.9 0.6	10.62 .95	67.0 1.7
28.2	43.21 .13	18.6 1.0	40.54 .39	75.7 2.0	52.29 .15	53.4 0.7	36.15 .12	40.4 0.5	9.70 .89	65.1 2.1
Sept. 7.1	43.08 .11	17.5 1.1	40.17 .35	73.6 2.4	52.15 .13	52.5 1.0	36.04 .11	39.9 0.4	8.85 .80	62.7 2.6
17.1	42.98 .09	16.4 1.1	39.85 .29	71.0 2.8	52.04 .10	51.3 1.4	35.94 .08	39.5 0.3	8.10 .70	59.9 3.0
27.1	42.91 .05	15.4 1.0	39.59 .23	68.0 3.1	51.94 .07	49.8 1.7	35.87 .05	39.2 0.2	7.47 .58	56.8 3.3
Oct. 7.1	42.88 .01	14.4 0.9	39.39 .16	64.7 3.4	51.89 .04	47.9 2.0	35.84 .01	39.2 0.0	6.97 .42	53.4 3.5
17.0	42.89 .04	13.5 0.8	39.28 .07	61.2 3.6	51.87 .01	45.8 2.2	35.84 .03	39.2 0.2	6.63 .26	49.8 3.7
27.0	42.96 .09	12.8 0.6	39.25 .02	57.5 3.8	51.90 .06	43.5 2.5	35.89 .07	39.6 0.4	6.45 .09	46.0 3.8
Nov. 6.0	43.08 .15	12.4 0.3	39.31 .11	53.8 3.8	51.99 .11	40.9 2.7	35.99 .12	40.1 0.7	6.46 .09	42.2 3.8
15.9	43.25 .20	12.3 0.0	39.47 .21	50.0 3.7	52.12 .16	38.2 2.8	36.14 .17	40.9 0.9	6.64 .28	38.4 3.7
25.9	43.47 .25	12.4 0.3	39.72 .30	46.3 3.6	52.30 .21	35.4 2.8	36.33 .22	42.0 1.2	7.01 .46	34.8 3.5
Dec. 5.9	43.74 .29	12.9 0.6	40.07 .39	42.9 3.3	52.53 .25	32.6 2.8	36.57 .26	43.3 1.4	7.57 .64	31.4 3.2
15.9	44.04 .32	13.7 1.0	40.49 .46	39.7 3.0	52.80 .29	29.8 2.7	36.84 .29	44.8 1.6	8.28 .79	28.3 2.9
25.8	44.38 .34	14.9 1.3	40.99 .52	37.0 2.6	53.10 .32	27.2 2.5	37.15 .31	46.5 1.7	9.14 .92	25.7 2.4
35.8	44.73 .36	16.2 1.5	41.53 .56	34.8 2.0	53.43 .34	24.8 2.3	37.47 .33	48.2 1.8	10.13 1.03	23.6 1.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Octantis.		α Bootis. (*Arcturus.*)		λ Bootis.		λ Virginis.		θ Bootis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 14 10	° ′ −83 12	h m 14 11	° ′ +19 41	h m 14 12	° ′ +46 32	h m 14 13	° ′ −12 54	h m 14 21	° ′ +52 18
	s	″	s	″	s	″	s	″	s	″
Jan. 0.8	51.71 2.09	21.7 0.4	6.38 .32	58.2 2.4	34.88 .39	31.4 2.5	42.44 .33	40.9 1.7	47.20 .41	26.5 2.5
10.8	53.84 2.16	21.6 0.2	6.70 .33	55.9 2.1	35.28 .40	29.2 2.0	42.77 .34	42.7 1.8	47.62 .43	24.2 2.0
20.8	56.00 2.16	22.1 0.8	7.03 .33	54.0 1.8	35.68 .40	27.5 1.4	43.10 .33	44.4 1.8	48.06 .44	22.5 1.4
30.7	58.14 2.12	23.1 1.3	7.36 .32	52.4 1.4	36.08 .40	26.4 0.8	43.43 .32	46.2 1.7	48.50 .44	21.4 0.8
Feb. 9.7	60.21 2.02	24.7 1.8	7.67 .30	51.2 1.0	36.48 .38	25.9 0.2	43.75 .30	47.9 1.6	48.93 .42	20.9 0.2
19.7	62.16 1.87	26.8 2.3	7.96 .28	50.4 0.5	36.84 .35	26.0 0.4	44.04 .28	49.4 1.5	49.34 .39	21.0 0.5
Mar. 1.7	63.94 1.69	29.2 2.7	8.22 .25	50.2 0.1	37.18 .31	26.7 1.0	44.30 .25	50.8 1.3	49.71 .35	21.8 1.1
11.6	65.54 1.48	32.1 3.0	8.45 .21	50.3 0.3	37.46 .27	27.9 1.5	44.54 .22	52.0 1.1	50.03 .30	23.2 1.6
21.6	66.90 1.25	35.2 3.2	8.65 .18	50.8 0.7	37.71 .22	29.7 1.9	44.75 .19	53.0 0.9	50.31 .25	25.0 2.1
31.6	68.03 1.00	38.5 3.4	8.81 .14	51.8 1.1	37.90 .17	31.8 2.3	44.92 .16	53.8 0.7	50.53 .19	27.3 2.4
Apr. 10.5	68.90 .73	42.0 3.5	8.93 .11	53.0 1.3	38.04 .11	34.2 2.5	45.06 .13	54.4 0.5	50.69 .13	29.9 2.7
20.5	69.49 .46	45.5 3.5	9.02 .07	54.4 1.5	38.12 .06	36.9 2.7	45.17 .10	54.8 0.3	50.79 .07	32.7 2.9
30.5	69.82 .18	49.0 3.5	9.08 .04	55.9 1.6	38.16 .01	39.6 2.8	45.25 .07	55.0 0.1	50.84 .02	35.6 2.9
May 10.5	69.86 .10	52.4 3.4	9.10 .01	57.6 1.7	38.15 .03	42.4 2.7	45.30 .04	55.1 0.0	50.82 .04	38.5 2.9
20.4	69.62 .37	55.7 3.1	9.10 .02	59.3 1.7	38.10 .07	45.0 2.6	45.33 .01	55.0 0.1	50.76 .09	41.3 2.7
30.4	69.12 .63	58.7 2.9	9.07 .04	60.9 1.6	38.01 .11	47.5 2.3	45.32 .02	54.8 0.2	50.65 .13	43.9 2.5
June 9.4	68.37 .88	61.4 2.5	9.02 .07	62.4 1.5	37.88 .15	49.7 2.1	45.30 .04	54.6 0.3	50.50 .17	46.2 2.2
19.4	67.38 1.09	63.7 2.1	8.94 .09	63.8 1.3	37.72 .17	51.6 1.7	45.25 .06	54.2 0.4	50.31 .21	48.2 1.8
29.3	66.19 1.28	65.6 1.6	8.84 .11	65.0 1.1	37.53 .20	53.1 1.3	45.17 .08	53.8 0.5	50.09 .23	49.8 1.4
July 9.3	64.83 1.44	67.0 1.2	8.72 .13	66.0 0.9	37.32 .22	54.2 0.9	45.08 .10	53.3 0.5	49.84 .26	51.0 1.0
19.3	63.33 1.54	67.9 0.6	8.58 .14	66.7 0.6	37.09 .23	54.9 0.5	44.97 .12	52.7 0.6	49.57 .28	51.7 0.5
29.3	61.76 1.60	68.3 0.1	8.44 .15	67.2 0.3	36.86 .24	55.1 0.0	44.84 .13	52.1 0.6	49.29 .29	52.0 0.0
Aug. 8.2	60.15 1.60	68.1 0.5	8.29 .15	67.4 0.0	36.61 .24	54.9 0.5	44.71 .14	51.5 0.6	49.00 .29	51.7 0.5
18.2	58.58 1.54	67.3 1.0	8.14 .15	67.3 0.2	36.37 .24	54.2 0.9	44.57 .14	50.9 0.6	48.71 .28	51.0 1.0
28.2	57.09 1.42	66.0 1.6	7.99 .14	66.9 0.5	36.14 .22	53.1 1.3	44.44 .13	50.3 0.6	48.43 .27	49.8 1.4
Sept. 7.1	55.74 1.26	64.1 2.1	7.85 .13	66.2 0.8	35.93 .20	51.5 1.8	44.32 .11	49.7 0.5	48.17 .25	48.1 1.9
17.1	54.60 1.02	61.9 2.5	7.74 .10	65.2 1.1	35.74 .17	49.6 2.2	44.22 .09	49.2 0.5	47.94 .21	46.0 2.3
27.1	53.71 .74	59.2 2.8	7.65 .07	64.0 1.4	35.59 .13	47.2 2.5	44.14 .06	48.8 0.4	47.75 .17	43.6 2.7
Oct. 7.1	53.13 .42	56.3 3.0	7.59 .04	62.4 1.7	35.48 .09	44.6 2.8	44.10 .02	48.5 0.2	47.60 .12	40.8 3.0
17.0	52.88 .08	53.2 3.1	7.57 .00	60.6 2.0	35.42 .03	41.6 3.1	44.10 .02	48.4 0.0	47.51 .06	37.6 3.2
27.0	52.98 .29	50.1 3.1	7.60 .05	58.5 2.2	35.42 .03	38.4 3.3	44.14 .07	48.5 0.2	47.48 .00	34.3 3.4
Nov. 6.0	53.45 .65	47.1 3.0	7.68 .10	56.2 2.4	35.48 .09	35.0 3.4	44.24 .12	48.9 0.5	47.52 .07	30.8 3.6
16.0	54.28 1.00	44.2 2.7	7.80 .15	53.7 2.6	35.60 .15	31.6 3.5	44.38 .17	49.5 0.7	47.62 .14	27.1 3.6
25.9	55.45 1.32	41.7 2.4	7.98 .20	51.0 2.7	35.78 .21	28.1 3.4	44.58 .22	50.4 1.0	47.80 .21	23.5 3.6
Dec. 5.9	56.92 1.60	39.5 1.9	8.20 .24	48.4 2.7	36.03 .27	24.7 3.3	44.81 .26	51.5 1.2	48.05 .28	20.0 3.4
15.9	58.64 1.83	37.9 1.4	8.46 .28	45.7 2.6	36.33 .32	21.5 3.0	45.09 .29	52.8 1.4	48.36 .33	16.7 3.1
25.8	60.56 1.99	36.8 0.8	8.75 .31	43.1 2.5	36.67 .36	18.7 2.7	45.39 .31	54.3 1.6	48.72 .38	13.8 2.8
35.8	62.62 2.12	36.3 0.2	9.06 .32	40.7 2.3	37.05 .39	16.2 2.3	45.71 .33	56.0 1.7	49.12 .42	11.2 2.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ρ Bootis.		5 Ursæ Minoris.		α² Centauri.		33 Bootis.		α Apodis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 14 27	° ′ +30 48	h m 14 27	° ′ +76 7	h m 14 32	° ′ −60 25	h m 14 35	° ′ +44 49	h m 14 35	° ′ −78 36
	s	″	s	″	s	″	s	″	s	″
Jan. 0.8	31.36 .33	22.2 2.5	40.76 .84	63.9 2.2	48.68 .56	11.1 0.1	6.73 .37	51.9 2.6	25.21 1.28	59.5 0.6
10.8	31.69 .34	19.8 2.1	41.63 .91	61.9 1.7	49.24 .57	11.2 0.4	7.10 .38	49.4 2.2	26.51 1.33	59.2 0.1
20.8	32.04 .34	17.9 1.7	42.57 .96	60.5 1.1	49.82 .58	11.9 0.9	7.49 .39	47.5 1.7	27.85 1.35	59.3 0.5
30.8	32.38 .34	16.4 1.2	43.54 .97	59.7 0.4	50.39 .57	13.0 1.3	7.89 .39	46.2 1.1	29.20 1.34	60.1 1.0
Feb. 9.7	32.72 .33	15.4 0.7	44.50 .95	59.7 0.3	50.95 .55	14.5 1.7	8.27 .38	45.4 0.5	30.52 1.29	61.3 1.5
19.7	33.04 .30	14.9 0.2	45.42 .89	60.3 0.9	51.48 .51	16.4 2.0	8.64 .35	45.2 0.1	31.78 1.22	63.1 2.0
Mar. 1.7	33.33 .28	15.0 0.3	46.27 .80	61.6 1.6	51.97 .47	18.5 2.3	8.98 .32	45.7 0.7	32.96 1.13	65.2 2.3
11.6	33.58 .24	15.6 0.8	47.02 .70	63.4 2.1	52.41 .42	20.9 2.5	9.28 .28	46.7 1.3	34.03 1.01	67.8 2.7
21.6	33.81 .20	16.7 1.2	47.64 .55	65.8 2.6	52.81 .37	23.5 2.6	9.54 .24	48.2 1.8	34.98 .88	70.6 3.0
31.6	33.99 .16	18.1 1.6	48.12 .40	68.5 2.9	53.14 .31	26.2 2.7	9.76 .19	50.2 2.2	35.79 .74	73.7 3.1
Apr. 10.6	34.14 .13	19.9 1.9	48.44 .24	71.5 3.1	53.42 .25	28.9 2.8	9.92 .14	52.5 2.5	36.46 .59	76.9 3.3
20.5	34.24 .09	21.9 2.1	48.60 .08	74.7 3.2	53.64 .19	31.7 2.8	10.04 .09	55.1 2.7	36.97 .43	80.2 3.3
30.5	34.31 .05	24.1 2.2	48.61 .08	78.0 3.2	53.80 .13	34.4 2.7	10.11 .05	57.8 2.7	37.31 .27	83.5 3.3
May 10.5	34.35 .02	26.4 2.2	48.45 .23	81.1 3.1	53.89 .06	37.0 2.6	10.14 .00	60.6 2.7	37.50 .10	86.8 3.2
20.5	34.34 .02	28.6 2.2	48.15 .37	84.1 2.9	53.92 .00	39.5 2.4	10.12 .04	63.3 2.7	37.51 .07	90.0 3.0
30.4	34.31 .05	30.8 2.1	47.72 .50	86.8 2.6	53.89 .06	41.8 2.2	10.05 .08	65.9 2.5	37.36 .23	93.0 2.8
June 9.4	34.25 .08	32.8 1.9	47.16 .61	89.2 2.2	53.80 .12	43.8 1.9	9.95 .12	68.2 2.2	37.06 .38	95.7 2.6
19.4	34.16 .10	34.6 1.7	46.50 .70	91.1 1.7	53.66 .17	45.5 1.5	9.82 .15	70.3 1.9	36.60 .53	98.0 2.2
29.3	34.04 .13	36.1 1.4	45.76 .78	92.6 1.2	53.46 .22	46.8 1.2	9.65 .17	72.1 1.6	36.00 .66	100.0 1.8
July 9.3	33.91 .15	37.4 1.1	44.96 .83	93.6 0.7	53.22 .27	47.8 0.8	9.46 .20	73.4 1.2	35.29 .77	101.6 1.3
19.3	33.75 .16	38.3 0.7	44.11 .86	94.1 0.2	52.93 .31	48.4 0.4	9.25 .22	74.4 0.7	34.48 .85	102.7 0.8
29.3	33.58 .17	38.8 0.4	43.23 .88	94.0 0.3	52.61 .33	48.5 0.1	9.02 .24	74.8 0.3	33.59 .91	103.2 0.3
Aug. 8.2	33.40 .18	39.0 0.0	42.35 .88	93.4 0.9	52.27 .34	48.2 0.5	8.78 .24	74.9 0.2	32.67 .94	103.3 0.2
18.2	33.22 .18	38.8 0.4	41.48 .85	92.3 1.4	51.93 .34	47.5 1.0	8.53 .24	74.5 0.6	31.73 .93	102.8 0.8
28.2	33.05 .17	38.3 0.7	40.64 .81	90.7 1.9	51.59 .33	46.3 1.4	8.30 .23	73.6 1.1	30.83 .88	101.7 1.3
Sept. 7.2	32.88 .16	37.4 1.1	39.87 .75	88.6 2.3	51.28 .30	44.7 1.7	8.07 .21	72.4 1.5	29.99 .80	100.1 1.8
17.1	32.73 .14	36.1 1.5	39.16 .66	86.0 2.7	51.00 .25	42.8 2.0	7.87 .19	70.6 1.9	29.25 .68	98.1 2.2
27.1	32.61 .11	34.5 1.8	38.55 .56	83.1 3.1	50.78 .19	40.7 2.3	7.70 .15	68.5 2.3	28.64 .52	95.7 2.6
Oct. 7.1	32.52 .07	32.5 2.1	38.05 .44	79.9 3.4	50.62 .12	38.3 2.4	7.56 .11	66.0 2.6	28.21 .34	93.0 2.8
17.0	32.48 .02	30.2 2.4	37.68 .30	76.4 3.6	50.55 .03	35.9 2.5	7.48 .06	63.2 2.9	27.97 .14	90.0 3.0
27.0	32.48 .03	27.7 2.6	37.46 .15	72.7 3.8	50.56 .06	33.4 2.4	7.44 .00	60.2 3.2	27.94 .08	87.0 3.0
Nov. 6.0	32.53 .08	24.9 2.8	37.39 .01	68.9 3.8	50.67 .15	31.1 2.3	7.47 .06	56.9 3.3	28.14 .31	84.0 2.9
16.0	32.63 .13	22.0 3.0	37.48 .18	65.1 3.8	50.87 .25	28.9 2.0	7.56 .12	53.5 3.4	28.55 .53	81.2 2.7
25.9	32.79 .18	19.0 3.0	37.74 .34	61.4 3.6	51.16 .33	27.0 1.7	7.71 .18	50.0 3.5	29.19 .73	78.6 2.4
Dec. 5.9	33.00 .23	16.0 3.0	38.16 .50	57.8 3.4	51.54 .41	25.5 1.3	7.93 .24	46.6 3.3	30.02 .92	76.4 2.0
15.9	33.26 .27	13.0 2.9	38.74 .64	54.6 3.1	51.98 .48	24.4 0.9	8.19 .29	43.4 3.1	31.02 1.08	74.6 1.5
25.9	33.55 .31	10.2 2.7	39.44 .77	51.8 2.6	52.48 .53	23.8 0.4	8.51 .34	40.3 2.8	32.16 1.20	73.3 1.0
35.8	33.87 .33	7.7 2.4	40.26 .87	49.4 2.1	53.03 .56	23.7 0.1	8.86 .37	37.7 2.4	33.40 1.28	72.5 0.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Bootis.		α² Libræ.		β Ursæ Minoris.		β Bootis.		γ Scorpii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 14 40	° ′ +27 29	h m 14 45	° ′ −15 37	h m 14 50	° ′ +74 33	h m 14 58	° ′ +40 46	h m 14 58	° ′ −24 53
	s	″	s	″	s	″	s	″	s	″
Jan. 0.8	37.28 .32	31.1 2.5	21.15 .32	35.1 1.5	56.42 .71	30.4 2.6	10.44 .33	50.1 2.8	13.38 .34	17.8 1.1
10.8	37.60 .33	28.7 2.2	21.47 .33	36.6 1.5	57.17 .79	28.2 2.0	10.78 .35	47.5 2.3	13.72 .34	19.0 1.2
20.8	37.94 .34	26.7 1.8	21.81 .34	38.2 1.6	57.99 .85	26.4 1.4	11.15 .37	45.4 1.9	14.07 .35	20.2 1.3
30.8	38.28 .33	25.1 1.4	22.14 .33	39.8 1.6	58.86 .88	25.4 0.7	11.52 .37	43.8 1.3	14.42 .35	21.6 1.4
Feb. 9.7	38.61 .32	24.0 0.9	22.47 .32	41.3 1.5	59.74 .87	25.0 0.0	11.89 .36	42.7 0.7	14.76 .34	23.1 1.5
19.7	38.92 .30	23.3 0.4	22.77 .30	42.8 1.4	60.59 .84	25.3 0.6	12.24 .35	42.3 0.1	15.10 .32	24.6 1.5
Mar. 1.7	39.21 .28	23.2 0.1	23.06 .28	44.1 1.3	61.40 .77	26.3 1.3	12.58 .32	42.4 0.4	15.40 .30	26.0 1.4
11.7	39.47 .25	23.6 0.6	23.32 .25	45.3 1.1	62.12 .68	27.8 1.9	12.88 .29	43.2 1.0	15.69 .27	27.4 1.3
21.6	39.70 .21	24.5 1.1	23.56 .22	46.3 0.9	62.75 .57	29.9 2.4	13.15 .25	44.4 1.5	15.95 .24	28.7 1.2
31.6	39.90 .18	25.8 1.5	23.76 .19	47.1 0.7	63.25 .44	32.5 2.8	13.38 .21	46.1 1.9	16.18 .21	29.9 1.1
Apr. 10.6	40.05 .14	27.4 1.7	23.93 .16	47.8 0.6	63.62 .30	35.4 3.0	13.57 .17	48.3 2.2	16.37 .18	31.0 1.0
20.5	40.17 .10	29.3 2.0	24.08 .13	48.2 0.4	63.86 .16	38.5 3.2	13.72 .12	50.7 2.5	16.54 .15	31.9 0.9
30.5	40.26 .07	31.3 2.1	24.19 .10	48.5 0.2	63.95 .02	41.8 3.3	13.82 .08	53.3 2.7	16.68 .12	32.7 0.8
May 10.5	40.31 .03	33.5 2.2	24.28 .07	48.7 0.1	63.89 .12	45.0 3.2	13.88 .04	56.0 2.7	16.78 .09	33.4 0.6
20.5	40.33 .00	35.6 2.2	24.33 .04	48.8 0.0	63.70 .25	48.1 3.0	13.89 .00	58.7 2.7	16.86 .05	34.0 0.5
30.4	40.31 .03	37.8 2.1	24.36 .01	48.7 0.1	63.39 .37	51.0 2.8	13.87 .04	61.3 2.6	16.90 .02	34.5 0.4
June 9.4	40.27 .06	39.7 1.9	24.36 .02	48.6 0.2	62.96 .48	53.7 2.4	13.80 .08	63.8 2.4	16.91 .02	34.8 0.3
19.4	40.19 .09	41.6 1.7	24.33 .04	48.3 0.3	62.43 .58	55.9 2.0	13.70 .12	66.0 2.1	16.89 .04	35.0 0.1
29.4	40.09 .11	43.2 1.5	24.27 .07	48.0 0.4	61.81 .66	57.7 1.6	13.57 .15	67.9 1.8	16.84 .07	35.1 0.0
July 9.3	39.97 .13	44.4 1.2	24.19 .09	47.6 0.4	61.11 .72	59.0 1.1	13.41 .17	69.5 1.4	16.76 .10	35.0 0.1
19.3	39.83 .15	45.5 0.9	24.08 .11	47.2 0.5	60.37 .77	59.9 0.6	13.22 .20	70.6 1.0	16.65 .12	34.9 0.3
29.3	39.67 .17	46.2 0.5	23.96 .13	46.7 0.5	59.58 .80	60.2 0.0	13.02 .21	71.4 0.6	16.52 .14	34.5 0.4
Aug. 8.2	39.50 .17	46.5 0.2	23.82 .14	46.1 0.6	58.78 .81	59.9 0.5	12.80 .23	71.8 0.1	16.37 .16	34.1 0.5
18.2	39.32 .18	46.5 0.2	23.68 .15	45.6 0.6	57.98 .80	59.2 1.0	12.57 .23	71.7 0.3	16.22 .16	33.5 0.6
28.2	39.14 .17	46.1 0.5	23.53 .14	45.0 0.6	57.19 .77	57.9 1.5	12.34 .23	71.2 0.7	16.05 .16	32.8 0.7
Sept. 7.2	38.98 .16	45.4 0.9	23.39 .13	44.4 0.6	56.44 .72	56.1 2.0	12.11 .22	70.2 1.2	15.90 .15	32.1 0.8
17.1	38.82 .14	44.3 1.3	23.26 .11	43.8 0.5	55.75 .66	53.9 2.4	11.91 .20	68.8 1.6	15.76 .13	31.2 0.8
27.1	38.70 .11	42.9 1.6	23.16 .09	43.3 0.4	55.14 .57	51.2 2.8	11.73 .17	67.0 2.0	15.64 .10	30.4 0.8
Oct. 7.1	38.60 .08	41.1 1.9	23.09 .05	42.9 0.3	54.61 .47	48.2 3.2	11.58 .13	64.9 2.4	15.55 .07	29.6 0.8
17.1	38.55 .03	39.1 2.2	23.06 .01	42.7 0.2	54.20 .35	44.9 3.4	11.48 .08	62.4 2.7	15.50 .02	28.8 0.7
27.0	38.54 .01	36.7 2.5	23.08 .04	42.6 0.0	53.92 .22	41.4 3.6	11.42 .03	59.5 3.0	15.51 .03	28.2 0.6
Nov. 6.0	38.58 .07	34.2 2.7	23.14 .09	42.7 0.2	53.77 .08	37.6 3.8	11.42 .03	56.5 3.2	15.56 .08	27.7 0.4
16.0	38.67 .12	31.4 2.8	23.25 .14	43.0 0.5	53.77 .08	33.8 3.8	11.48 .09	53.2 3.3	15.67 .14	27.4 0.1
25.9	38.81 .17	28.5 2.9	23.42 .19	43.6 0.7	53.92 .23	30.0 3.7	11.60 .15	49.9 3.4	15.84 .19	27.4 0.1
Dec. 5.9	39.01 .22	25.6 2.9	23.63 .23	44.5 1.0	54.23 .38	26.4 3.5	11.78 .22	46.5 3.3	16.05 .24	27.7 0.4
15.9	39.25 .26	22.6 2.8	23.89 .27	45.6 1.2	54.68 .52	23.0 3.2	12.02 .26	43.2 3.2	16.31 .28	28.2 0.6
25.9	39.53 .30	19.9 2.7	24.18 .30	46.8 1.4	55.26 .64	20.0 2.8	12.30 .31	40.1 2.9	16.61 .31	29.0 0.9
35.8	39.84 .32	17.3 2.4	24.49 .33	48.2 1.5	55.96 .75	17.3 2.4	12.62 .34	37.4 2.6	16.93 .34	29.9 1.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.		δ Bootis.		β Libræ.		ρ Octantis.		μ¹ Bootis.		γ² Ursæ Minoris.	
		Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
·		h m 15 11	° ′ +33 40	h m 15 11	° ′ − 9 0	h m 15 20	° ′ −84 7	h m 15 20	° ′ +37 43	h m 15 20	° ′ +72 10
		s	″	s	″	s	″	s	″	s	″
Jan.	0.9	28.05 .30	62.7 2.8	37.78 .30	52.4 1.6	8.37 2.17	42.5 1.4	42.37 .31	26.5 2.9	49.89 .57	65.2 2.9
	10.8	28.37 .33	60.1 2.4	38.09 .31	54.0 1.6	10.65 2.37	41.3 0.9	42.70 .33	23.8 2.5	50.50 .65	62.6 2.4
	20.8	28.70 .34	57.9 2.0	38.41 .32	55.6 1.6	13.09 2.50	40.6 0.4	43.04 .35	21.5 2.0	51.19 .71	60.5 1.8
	30.8	29.05 .35	56.1 1.5	38.73 .32	57.2 1.5	15.62 2.56	40.5 0.2	43.39 .35	19.7 1.5	51.93 .75	59.0 1.1
Feb.	9.8	29.40 .34	54.9 1.0	39.05 .31	58.6 1.4	18.19 2.55	41.0 0.7	43.75 .35	18.4 1.0	52.70 .77	58.2 0.5
	19.7	29.73 .33	54.2 0.4	39.36 .30	59.9 1.2	20.72 2.49	41.9 1.2	44.10 .34	17.7 0.4	53.46 .75	58.1 0.2
Mar.	1.7	30.05 .31	54.0 0.2	39.65 .28	60.9 1.0	23.15 2.38	43.4 1.7	44.43 .32	17.6 0.2	54.20 .71	58.6 0.9
	11.7	30.34 .28	54.5 0.7	39.92 .26	61.8 0.8	25.45 2.21	45.3 2.1	44.74 .29	18.1 0.8	54.89 .65	59.8 1.5
	21.6	30.60 .25	55.4 1.2	40.16 .23	62.4 0.5	27.57 2.01	47.6 2.5	45.02 .26	19.2 1.3	55.50 .57	61.6 2.0
	31.6	30.84 .21	56.8 1.6	40.38 .20	62.9 0.3	29.46 1.77	50.2 2.8	45.26 .23	20.7 1.7	56.02 .46	63.9 2.5
Apr.	10.6	31.03 .18	58.6 2.0	40.57 .18	63.1 0.1	31.10 1.50	53.1 3.0	45.47 .19	22.6 2.1	56.43 .35	66.6 2.9
	20.6	31.18 .14	60.8 2.2	40.74 .15	63.1 0.1	32.46 1.21	56.2 3.2	45.64 .15	24.9 2.4	56.73 .24	69.6 3.1
	30.5	31.30 .10	63.1 2.4	40.87 .12	62.9 0.2	33.51 .90	59.4 3.3	45.76 .11	27.4 2.6	56.90 .12	72.8 3.2
May	10.5	31.38 .06	65.6 2.5	40.98 .09	62.6 0.3	34.25 .56	62.7 3.3	45.85 .07	30.0 2.7	56.96 .00	76.1 3.3
	20.5	31.42 .02	68.1 2.5	41.06 .06	62.2 0.4	34.64 .23	66.0 3.2	45.90 .03	32.7 2.7	56.90 .12	79.4 3.2
	30.5	31.43 .02	70.6 2.4	41.10 .03	61.8 0.5	34.70 .11	69.2 3.1	45.90 .01	35.4 2.6	56.71 .23	82.5 3.0
June	9.4	31.40 .05	72.9 2.3	41.12 .00	61.2 0.5	34.42 .45	72.2 2.9	45.87 .05	37.9 2.4	56.42 .34	85.4 2.7
	19.4	31.33 .08	75.1 2.1	41.11 .03	60.7 0.6	33.80 .77	75.0 2.7	45.80 .09	40.2 2.2	56.04 .43	87.9 2.4
	29.4	31.23 .11	77.0 1.8	41.07 .05	60.1 0.6	32.88 1.07	77.6 2.3	45.70 .12	42.3 1.9	55.56 .51	90.2 2.0
July	9.3	31.10 .14	78.6 1.5	41.00 .08	59.5 0.6	31.68 1.34	79.7 1.9	45.56 .15	44.0 1.6	55.01 .58	91.9 1.5
	19.3	30.95 .16	79.9 1.1	40.91 .10	58.9 0.6	30.23 1.56	81.4 1.4	45.39 .18	45.5 1.2	54.39 .64	93.2 1.0
	29.3	30.78 .18	80.9 0.7	40.80 .12	58.4 0.5	28.58 1.73	82.6 0.9	45.20 .20	46.5 0.8	53.73 .68	94.0 0.5
Aug.	8.3	30.58 .20	81.4 0.3	40.66 .14	57.8 0.5	26.78 1.85	83.3 0.4	45.00 .21	47.1 0.4	53.04 .70	94.2 0.0
	18.2	30.38 .21	81.6 0.1	40.52 .15	57.3 0.5	24.90 1.90	83.4 0.2	44.78 .22	47.3 0.0	52.33 .71	93.9 0.5
	28.2	30.18 .21	81.3 0.5	40.37 .15	56.9 0.4	23.01 1.88	83.0 0.7	44.55 .22	47.1 0.4	51.62 .70	93.1 1.1
Sept.	7.2	29.97 .20	80.6 0.9	40.22 .14	56.5 0.3	21.17 1.78	81.9 1.3	44.33 .22	46.4 0.9	50.93 .68	91.8 1.6
	17.2	29.78 .18	79.6 1.3	40.08 .13	56.2 0.3	19.47 1.61	80.4 1.8	44.12 .20	45.3 1.3	50.27 .63	90.0 2.0
	27.1	29.61 .16	78.1 1.6	39.96 .11	56.0 0.1	17.97 1.37	78.4 2.2	43.92 .18	43.8 1.7	49.67 .56	87.7 2.5
Oct.	7.1	29.48 .12	76.3 2.0	39.87 .07	55.9 0.0	16.74 1.07	75.9 2.6	43.76 .14	41.9 2.1	49.14 .48	85.1 2.9
	17.1	29.38 .08	74.1 2.3	39.81 .03	56.0 0.2	15.85 .71	73.1 2.9	43.64 .10	39.7 2.4	48.70 .39	82.0 3.2
	27.0	29.32 .03	71.7 2.6	39.80 .01	56.3 0.4	15.34 .31	70.1 3.1	43.57 .05	37.1 2.7	48.37 .28	78.7 3.5
Nov.	6.0	29.32 .02	68.9 2.9	39.83 .06	56.8 0.6	15.24 .11	67.0 3.1	43.54 .01	34.2 3.0	48.15 .15	75.1 3.7
	16.0	29.37 .08	65.9 3.0	39.92 .11	57.5 0.8	15.58 .55	63.8 3.1	43.58 .06	31.1 3.2	48.06 .02	71.4 3.8
	26.0	29.48 .14	62.8 3.1	40.05 .16	58.4 1.0	16.33 .97	60.8 2.9	43.67 .12	27.9 3.3	48.11 .12	67.6 3.8
Dec.	5.9	29.64 .19	59.7 3.1	40.23 .20	59.5 1.2	17.50 1.36	58.0 2.6	43.82 .18	24.6 3.3	48.29 .25	63.9 3.6
	15.9	29.85 .24	56.6 3.1	40.46 .24	60.8 1.4	19.04 1.71	55.6 2.2	44.03 .23	21.4 3.2	48.61 .38	60.3 3.4
	25.9	30.11 .28	53.6 2.9	40.72 .28	62.3 1.5	20.91 2.01	53.6 1.8	44.28 .27	18.3 3.0	49.05 .50	57.0 3.1
	35.9	30.40 .31	50.8 2.6	41.01 .30	63.8 1.6	23.04 2.25	52.0 1.4	44.58 .31	15.4 2.8	49.60 .60	54.1 2.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.		β Coronæ Borealis.		α Coronæ Borealis.		α Serpentis.		ε Serpentis		ζ Ursæ Minoris.	
		Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
		h m 15 23	° ′ +29 26	h m 15 30	° ′ +27 2	h m 15 39	° ′ + 6 44	h m 15 45	° ′ + 4 46	h m 15 47	° ′ +78 5
		s	″	s	″	s	″	s	″	s	″
Jan.	0.9	42.16 .29	49.5 2.7	27.03 .28	53.3 2.7	20.56 .27	19.1 2.1	49.88 .26	38.7 2.0	31.39 .68	51.9 3.0
	10.9	42.46 .31	47.0 2.4	27.32 .30	50.7 2.4	20.84 .29	17.0 2.0	50.15 .29	36.8 1.9	32.15 .83	49.2 2.5
	20.8	42.78 .33	44.7 2.0	27.64 .32	48.5 2.0	21.14 .30	15.1 1.8	50.45 .30	34.9 1.7	33.04 .95	46.9 2.0
	30.8	43.12 .33	42.9 1.6	27.96 .33	46.6 1.6	21.45 .31	13.4 1.6	50.76 .31	33.2 1.5	34.04 1.04	45.2 1.4
Feb.	9.8	43.45 .33	41.5 1.1	28.29 .33	45.2 1.2	21.76 .31	12.0 1.3	51.07 .31	31.8 1.2	35.12 1.08	44.1 0.7
	19.7	43.78 .32	40.7 0.6	28.62 .32	44.3 0.7	22.06 .30	10.9 0.9	51.37 .30	30.7 0.9	36.21 1.09	43.7 0.1
Mar.	1.7	44.09 .31	40.4 0.0	28.92 .30	43.9 0.1	22.36 .28	10.2 0.6	51.66 .29	29.9 0.6	37.29 1.06	44.0 0.6
	11.7	44.38 .28	40.7 0.5	29.21 .28	44.1 0.4	22.63 .26	9.8 0.2	51.94 .27	29.5 0.3	38.33 .99	44.9 1.2
	21.7	44.64 .25	41.4 1.0	29.48 .25	44.7 0.9	22.89 .24	9.7 0.1	52.20 .25	29.4 0.1	39.27 .88	46.5 1.8
	31.6	44.87 .22	42.6 1.4	29.71 .22	45.8 1.3	23.12 .22	10.0 0.4	52.44 .22	29.6 0.4	40.09 .75	48.6 2.3
Apr.	10.6	45.07 .18	44.2 1.8	29.92 .19	47.3 1.7	23.33 .19	10.6 0.7	52.65 .20	30.2 0.7	40.77 .60	51.1 2.7
	20.6	45.24 .15	46.2 2.1	30.09 .15	49.1 2.0	23.50 .16	11.5 1.0	52.84 .17	31.0 0.9	41.29 .43	54.0 3.0
	30.6	45.37 .11	48.4 2.3	30.23 .12	51.2 2.2	23.66 .14	12.6 1.2	52.99 .14	32.0 1.1	41.63 .25	57.2 3.2
May	10.5	45.46 .07	50.7 2.4	30.33 .09	53.4 2.3	23.78 .11	13.9 1.3	53.12 .11	33.1 1.2	41.79 .07	60.4 3.3
	20.5	45.52 .03	53.1 2.4	30.40 .05	55.8 2.3	23.87 .08	15.3 1.4	53.22 .08	34.4 1.3	41.76 .12	63.7 3.2
	30.5	45.55 .00	55.5 2.3	30.43 .02	58.1 2.3	23.93 .05	16.7 1.4	53.29 .05	35.8 1.3	41.55 .29	66.9 3.1
June	9.4	45.54 .03	57.8 2.2	30.43 .02	60.3 2.2	23.97 .02	18.1 1.4	53.33 .02	37.1 1.3	41.17 .46	69.9 2.9
	19.4	45.49 .06	59.9 2.0	30.40 .05	62.4 2.0	23.97 .02	19.4 1.3	53.34 .01	38.4 1.3	40.63 .61	72.7 2.6
	29.4	45.41 .09	61.8 1.8	30.33 .08	64.3 1.8	23.94 .05	20.7 1.2	53.32 .04	39.6 1.2	39.95 .75	75.1 2.2
July	9.4	45.30 .12	63.5 1.5	30.23 .11	66.0 1.5	23.88 .07	21.9 1.1	53.26 .07	40.8 1.1	39.14 .86	77.1 1.8
	19.3	45.17 .15	64.9 1.2	30.11 .14	67.4 1.2	23.79 .10	22.9 1.0	53.18 .10	41.8 0.9	38.22 .96	78.7 1.3
	29.3	45.01 .17	65.9 0.9	29.96 .16	68.4 0.9	23.67 .12	23.8 0.8	53.07 .12	42.6 0.8	37.21 1.03	79.7 0.8
Aug.	8.3	44.83 .18	66.6 0.5	29.79 .18	69.2 0.6	23.54 .14	24.5 0.6	52.94 .14	43.3 0.6	36.15 1.08	80.3 0.3
	18.3	44.64 .19	66.9 0.1	29.60 .19	69.6 0.2	23.39 .15	25.0 0.4	52.79 .15	43.8 0.5	35.04 1.11	80.3 0.2
	28.2	44.44 .20	66.8 0.3	29.41 .19	69.6 0.2	23.23 .16	25.3 0.2	52.63 .16	44.2 0.3	33.92 1.11	79.9 0.7
Sept.	7.2	44.24 .19	66.4 0.6	29.22 .19	69.2 0.5	23.07 .16	25.4 0.0	52.47 .16	44.3 0.1	32.82 1.09	78.9 1.2
	17.2	44.06 .18	65.5 1.0	29.04 .18	68.5 0.9	22.91 .15	25.3 0.2	52.31 .15	44.3 0.2	31.75 1.03	77.4 1.7
	27.1	43.89 .15	64.3 1.4	28.87 .15	67.4 1.2	22.77 .13	25.0 0.5	52.17 .13	44.0 0.4	30.75 .96	75.4 2.2
Oct.	7.1	43.75 .12	62.8 1.8	28.73 .12	66.0 1.6	22.66 .10	24.4 0.7	52.05 .10	43.5 0.6	29.84 .85	73.0 2.6
	17.1	43.65 .08	60.8 2.1	28.62 .08	64.2 2.0	22.57 .07	23.5 0.9	51.96 .07	42.8 0.9	29.05 .72	70.2 3.0
	27.1	43.58 .04	58.6 2.4	28.56 .04	62.1 2.3	22.52 .03	22.4 1.2	51.91 .03	41.8 1.1	28.39 .57	67.1 3.3
Nov.	6.0	43.57 .01	56.1 2.6	28.55 .01	59.7 2.5	22.52 .02	21.1 1.4	51.90 .02	40.6 1.3	27.90 .40	63.7 3.5
	16.0	43.61 .07	53.3 2.8	28.58 .06	57.0 2.7	22.56 .07	19.5 1.7	51.94 .07	39.2 1.5	27.60 .21	60.1 3.6
	26.0	43.71 .12	50.4 3.0	28.67 .12	54.2 2.8	22.66 .12	17.8 1.9	52.03 .12	37.6 1.7	27.48 .01	56.4 3.7
Dec.	6.0	43.86 .17	47.4 3.0	28.81 .17	51.4 2.9	22.80 .17	15.8 2.0	52.17 .16	35.8 1.9	27.57 .19	52.8 3.6
	15.9	44.06 .22	44.4 3.0	29.01 .21	48.4 2.9	23.00 .21	13.8 2.1	52.36 .20	33.8 2.0	27.86 .38	49.2 3.5
	25.9	44.30 .26	41.5 2.8	29.24 .25	45.6 2.8	23.22 .25	11.7 2.1	52.58 .24	31.8 2.0	28.34 .57	45.8 3.2
	35.9	44.58 .30	38.8 2.6	29.52 .29	42.8 2.6	23.49 .28	9.6 2.1	52.84 .27	29.8 2.0	29.00 .74	42.8 2.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Coronæ Borealis.		δ Scorpii.		β¹ Scorpii.		δ¹ Apodis.		φ Herculis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 15 53	° ′ +27 9	h m 15 54	° ′ −22 20	h m 15 59	° ′ −19 31	h m 16 5	° ′ −78 26	h m 16 5	° ′ +45 11
	s	″	s	″	s	″	s	″	s	″
Jan. 0.9	26.50 .26	53.0 2.8	25.30 .29	11.8 0.8	37.38 .28	53.0 0.9	21.69 1.04	27.0 1.9	36.22 .27	37.7 3.1
10.9	26.78 .29	50.4 2.5	25.60 .31	12.6 0.9	37.67 .31	53.9 1.0	22.80 1.16	25.3 1.4	36.52 .31	34.7 2.8
20.8	27.08 .31	48.0 2.1	25.92 .33	13.6 1.0	37.99 .32	54.9 1.0	24.01 1.26	24.2 0.9	36.85 .34	32.1 2.4
30.8	27.40 .32	46.1 1.7	26.26 .34	14.6 1.1	38.31 .33	56.0 1.1	25.31 1.32	23.5 0.4	37.21 .36	30.0 1.8
Feb. 9.8	27.72 .32	44.5 1.3	26.60 .34	15.7 1.1	38.65 .33	57.0 1.1	26.66 1.35	23.3 0.1	37.58 .38	28.4 1.3
19.8	28.04 .32	43.5 0.8	26.93 .33	16.7 1.0	38.98 .32	58.1 1.0	28.01 1.35	23.6 0.5	37.96 .38	27.4 0.7
Mar. 1.7	28.36 .31	43.0 0.3	27.26 .32	17.7 1.0	39.29 .31	59.0 0.9	29.36 1.32	24.4 1.0	38.33 .36	27.1 0.0
11.7	28.65 .29	43.0 0.3	27.57 .30	18.7 0.9	39.60 .30	59.9 0.8	30.65 1.27	25.6 1.4	38.69 .35	27.3 0.6
21.7	28.93 .27	43.6 0.8	27.86 .28	19.5 0.8	39.89 .28	60.7 0.7	31.89 1.19	27.2 1.8	39.02 .32	28.2 1.2
31.6	29.18 .24	44.6 1.2	28.12 .26	20.3 0.7	40.15 .25	61.3 0.6	33.03 1.09	29.2 2.1	39.33 .29	29.7 1.7
Apr. 10.6	29.41 .21	46.0 1.6	28.37 .23	20.9 0.6	40.40 .23	61.8 0.4	34.07 .98	31.5 2.4	39.60 .25	31.6 2.2
20.6	29.60 .18	47.8 1.9	28.59 .20	21.5 0.5	40.62 .20	62.2 0.3	34.98 .84	34.0 2.7	39.83 .21	34.0 2.5
30.6	29.76 .14	49.9 2.2	28.78 .18	21.9 0.4	40.81 .18	62.4 0.2	35.76 .70	36.8 2.8	40.02 .16	36.6 2.8
May 10.5	29.89 .11	52.2 2.3	28.94 .15	22.3 0.3	40.97 .15	62.6 0.1	36.38 .54	39.7 2.9	40.16 .12	39.5 2.9
20.5	29.98 .07	54.6 2.4	29.07 .11	22.6 0.2	41.10 .12	62.7 0.1	36.84 .37	42.6 3.0	40.25 .07	42.5 3.0
30.5	30.04 .04	57.0 2.4	29.17 .08	22.8 0.2	41.21 .08	62.7 0.0	37.13 .20	45.6 3.0	40.30 .02	45.6 3.0
June 9.5	30.06 .00	59.3 2.3	29.23 .05	22.9 0.1	41.27 .05	62.7 0.0	37.24 .02	48.5 2.8	40.29 .03	48.5 2.9
19.4	30.04 .03	61.6 2.1	29.26 .01	23.0 0.1	41.31 .01	62.6 0.1	37.18 .15	51.3 2.7	40.24 .07	51.3 2.7
29.4	29.99 .07	63.6 1.9	29.26 .02	23.0 0.0	41.30 .02	62.5 0.1	36.93 .32	53.9 2.5	40.15 .11	53.8 2.4
July 9.4	29.91 .10	65.4 1.7	29.21 .06	23.0 0.1	41.26 .05	62.4 0.2	36.53 .49	56.2 2.1	40.01 .16	56.1 2.1
19.3	29.79 .13	67.0 1.4	29.14 .09	22.9 0.2	41.19 .09	62.2 0.2	35.96 .63	58.2 1.8	39.84 .19	58.0 1.7
29.3	29.65 .16	68.3 1.1	29.03 .12	22.7 0.2	41.09 .12	61.9 0.3	35.27 .76	59.8 1.3	39.63 .22	59.5 1.3
Aug. 8.3	29.48 .18	69.2 0.7	28.90 .14	22.4 0.3	40.96 .14	61.6 0.3	34.46 .86	60.9 0.9	39.39 .25	60.6 0.9
18.3	29.30 .19	69.7 0.4	28.74 .16	22.1 0.4	40.81 .16	61.2 0.4	33.57 .92	61.5 0.3	39.13 .27	61.2 0.4
28.2	29.10 .20	69.9 0.0	28.58 .17	21.7 0.5	40.65 .17	60.8 0.4	32.63 .95	61.6 0.2	38.85 .28	61.4 0.1
Sept. 7.2	28.90 .20	69.8 0.4	28.41 .17	21.2 0.5	40.48 .17	60.4 0.4	31.67 .95	61.1 0.7	38.57 .28	61.1 0.5
17.2	28.70 .19	69.2 0.7	28.24 .16	20.6 0.6	40.32 .16	59.9 0.5	30.75 .90	60.1 1.2	38.30 .27	60.3 1.0
27.2	28.52 .17	68.3 1.1	28.09 .14	20.1 0.6	40.16 .15	59.5 0.5	29.89 .81	58.6 1.7	38.03 .25	59.0 1.5
Oct. 7.1	28.36 .14	67.0 1.5	27.96 .11	19.5 0.6	40.03 .12	59.0 0.4	29.14 .68	56.6 2.2	37.80 .22	57.3 1.9
17.1	28.24 .11	65.3 1.8	27.86 .07	19.0 0.5	39.94 .08	58.6 0.4	28.54 .52	54.3 2.5	37.60 .18	55.2 2.3
27.1	28.15 .07	63.3 2.1	27.81 .03	18.5 0.4	39.88 .03	58.3 0.3	28.11 .33	51.6 2.8	37.45 .13	52.7 2.7
Nov. 6.0	28.11 .02	61.0 2.4	27.81 .02	18.1 0.3	39.87 .02	58.1 0.1	27.88 .12	48.7 2.9	37.35 .06	49.8 3.0
16.0	28.12 .04	58.5 2.6	27.86 .08	17.9 0.1	39.91 .07	58.0 0.0	27.87 .10	45.7 3.0	37.31 .01	46.7 3.2
26.0	28.18 .09	55.8 2.8	27.96 .13	17.9 0.1	40.01 .12	58.1 0.2	28.09 .33	42.8 2.9	37.33 .06	43.4 3.4
Dec. 6.0	28.30 .14	52.9 2.9	28.11 .18	18.0 0.2	40.16 .17	58.4 0.4	28.52 .54	39.9 2.7	37.42 .12	40.0 3.5
15.9	28.46 .19	50.0 2.9	28.32 .23	18.4 0.4	40.35 .22	59.0 0.6	29.17 .75	37.3 2.5	37.57 .18	36.5 3.4
25.9	28.68 .23	47.1 2.8	28.57 .27	18.9 0.6	40.59 .26	59.6 0.7	30.01 .92	34.9 2.1	37.78 .24	33.1 3.3
35.9	28.93 .27	44.3 2.7	28.85 .30	19.6 0.8	40.86 .29	60.4 0.9	31.02 1.07	33.0 1.6	38.04 .28	30.0 3.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 2320.		δ Ophiuchi.		σ Coronæ Borealis.		τ Herculis.		γ Apodis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 16 5	° ′ +68 4	h m 16 9	° ′ − 3 26	h m 16 10	° ′ +34 6	h m 16 16	° ′ +46 32	h m 16 18	° ′ −78 40
	s	″	s	″	s	″	s	″	s	″
Jan. 0.9	59.95 .39	10.9 3.3	6.28 .25	14.9 1.6	55.45 .25	33.9 3.0	43.07 .26	54.2 3.2	4.14 1.01	11.0 2.0
10.9	60.38 .47	7.8 2.8	6.55 .28	16.5 1.6	55.72 .28	31.0 2.7	43.35 .30	51.2 2.9	5.22 1.15	9.2 1.6
20.9	60.89 .54	5.2 2.3	6.84 .30	18.0 1.5	56.02 .31	28.5 2.3	43.68 .34	48.5 2.5	6.43 1.26	7.8 1.1
30.8	61.47 .60	3.2 1.7	7.14 .31	19.5 1.4	56.34 .33	26.4 1.9	44.03 .37	46.3 2.0	7.73 1.34	6.9 0.6
Feb. 9.8	62.09 .63	1.8 1.1	7.45 .31	20.8 1.2	56.67 .34	24.8 1.4	44.41 .38	44.6 1.4	9.09 1.37	6.5 0.1
19.8	62.72 .64	1.0 0.4	7.76 .30	21.9 1.0	57.01 .33	23.7 0.8	44.79 .38	43.5 0.8	10.47 1.38	6.6 0.3
Mar. 1.7	63.36 .62	0.9 0.3	8.06 .29	22.7 0.7	57.34 .32	23.1 0.2	45.17 .37	43.0 0.1	11.85 1.36	7.2 0.8
11.7	63.97 .59	1.5 0.9	8.35 .28	23.3 0.4	57.66 .31	23.2 0.3	45.54 .36	43.2 0.5	13.19 1.32	8.2 1.2
21.7	64.54 .54	2.8 1.5	8.62 .26	23.6 0.1	57.96 .29	23.8 0.9	45.89 .34	44.0 1.1	14.48 1.25	9.6 1.6
31.7	65.05 .48	4.6 2.1	8.87 .24	23.6 0.1	58.23 .26	24.9 1.4	46.21 .30	45.4 1.6	15.68 1.15	11.4 2.0
Apr. 10.6	65.49 .40	6.9 2.5	9.11 .22	23.4 0.3	58.48 .23	26.5 1.8	46.49 .26	47.3 2.1	16.78 1.04	13.6 2.3
20.6	65.85 .31	9.6 2.9	9.32 .20	23.0 0.5	58.70 .20	28.6 2.2	46.74 .22	49.7 2.5	17.76 .91	16.0 2.5
30.6	66.11 .22	12.7 3.2	9.50 .17	22.3 0.7	58.88 .16	30.9 2.5	46.94 .18	52.4 2.8	18.60 .77	18.6 2.7
May 10.5	66.29 .12	16.0 3.3	9.66 .14	21.6 0.8	59.02 .12	33.4 2.6	47.10 .13	55.3 3.0	19.29 .61	21.4 2.9
20.5	66.36 .02	19.3 3.3	9.78 .11	20.7 0.9	59.13 .09	36.1 2.7	47.21 .08	58.3 3.1	19.82 .44	24.3 2.9
30.5	66.34 .08	22.6 3.2	9.88 .08	19.8 1.0	59.19 .05	38.8 2.7	47.26 .03	61.4 3.0	20.17 .26	27.3 2.9
June 9.5	66.22 .17	25.8 3.1	9.94 .05	18.8 1.0	59.22 .01	41.5 2.6	47.27 .02	64.4 2.9	20.34 .08	30.2 2.9
19.4	66.01 .25	28.8 2.8	9.98 .02	17.8 0.9	59.20 .03	44.0 2.5	47.23 .06	67.3 2.8	20.33 .10	33.0 2.7
29.4	65.72 .33	31.5 2.5	9.98 .02	16.9 0.9	59.15 .07	46.4 2.3	47.14 .11	70.0 2.5	20.14 .28	35.7 2.5
July 9.4	65.35 .40	33.8 2.1	9.94 .05	16.1 0.8	59.06 .11	48.5 2.0	47.01 .15	72.4 2.2	19.77 .45	38.1 2.2
19.4	64.91 .46	35.7 1.7	9.88 .08	15.3 0.7	58.94 .14	50.3 1.6	46.84 .19	74.4 1.8	19.24 .61	40.2 1.9
29.3	64.41 .52	37.2 1.2	9.78 .11	14.6 0.7	58.78 .17	51.8 1.3	46.62 .23	76.0 1.4	18.56 .74	41.9 1.5
Aug. 8.3	63.87 .56	38.1 0.7	9.66 .13	13.9 0.6	58.59 .20	52.9 0.9	46.38 .26	77.2 1.0	17.76 .85	43.1 1.0
18.3	63.30 .58	38.6 0.2	9.52 .15	13.4 0.5	58.39 .22	53.6 0.5	46.11 .28	78.0 0.5	16.86 .93	43.9 0.5
28.3	62.71 .59	38.5 0.3	9.36 .16	13.0 0.3	58.16 .23	53.9 0.1	45.83 .29	78.3 0.0	15.91 .97	44.2 0.0
Sept. 7.2	62.11 .59	37.9 0.8	9.20 .16	12.7 0.2	57.94 .23	53.8 0.3	45.54 .29	78.1 0.4	14.93 .98	43.9 0.6
17.2	61.53 .57	36.8 1.3	9.04 .16	12.6 0.1	57.71 .22	53.2 0.8	45.25 .28	77.4 0.9	13.96 .94	43.0 1.1
27.2	60.98 .53	35.2 1.8	8.88 .14	12.6 0.1	57.50 .20	52.3 1.2	44.97 .26	76.2 1.4	13.06 .86	41.7 1.6
Oct. 7.1	60.47 .48	33.1 2.3	8.75 .12	12.7 0.2	57.31 .18	50.9 1.6	44.72 .24	74.6 1.8	12.26 .74	39.8 2.0
17.1	60.02 .41	30.6 2.7	8.65 .09	13.0 0.4	57.15 .14	49.1 2.0	44.50 .20	72.6 2.2	11.59 .58	37.6 2.4
27.1	59.66 .32	27.7 3.1	8.58 .05	13.6 0.6	57.03 .10	47.0 2.3	44.33 .15	70.1 2.6	11.10 .39	35.0 2.7
Nov. 6.1	59.38 .23	24.5 3.4	8.56 .00	14.3 0.8	56.95 .05	44.5 2.6	44.21 .09	67.3 3.0	10.81 .18	32.2 2.9
16.0	59.20 .12	21.0 3.6	8.58 .05	15.2 1.0	56.93 .01	41.8 2.8	44.15 .03	64.2 3.2	10.73 .04	29.2 3.0
26.0	59.14 .01	17.3 3.7	8.66 .10	16.2 1.2	56.97 .06	38.8 3.0	44.15 .04	60.9 3.4	10.89 .27	26.2 3.0
Dec. 6.0	59.19 .11	13.6 3.7	8.78 .15	17.5 1.4	57.06 .12	35.7 3.1	44.22 .10	57.4 3.5	11.27 .49	23.2 2.8
15.9	59.35 .22	9.9 3.6	8.95 .19	18.9 1.5	57.20 .17	32.6 3.1	44.36 .17	54.0 3.5	11.87 .70	20.5 2.6
25.9	59.63 .33	6.4 3.4	9.16 .23	20.4 1.6	57.40 .22	29.4 3.0	44.56 .23	50.5 3.3	12.68 .89	18.1 2.3
35.9	60.01 .43	3.1 3.1	9.41 .26	22.0 1.6	57.64 .26	26.5 2.9	44.81 .28	47.3 3.1	13.66 1.05	16.0 1.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Ursæ Minoris.		η Draconis.		α Scorpii. (*Antares.*)		β Herculis.		A Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 16 20	° ′ +75 58	h m 16 22	° ′ +61 44	h m 16 23	° ′ −26 12	h m 16 25	° ′ +21 42	h m 16 28	° ′ +68 58
	s	″	s	″	s	″	s	″	s	″
Jan. 0.9	19.82 .49	56.4 3.2	35.97 .30	14.0 3.4	16.54 .28	33.6 0.3	54.88 .23	20.0 2.6	7.20 .35	52.6 3.4
10.9	20.38 .63	53.3 2.8	36.32 .37	10.9 3.0	16.83 .31	34.0 0.5	55.13 .26	17.5 2.4	7.59 .45	49.4 3.0
20.9	21.07 .75	50.7 2.4	36.72 .43	8.1 2.5	17.15 .33	34.6 0.6	55.40 .28	15.2 2.2	8.08 .53	46.6 2.5
30.8	21.88 .85	48.6 1.8	37.18 .48	5.8 2.0	17.48 .34	35.3 0.7	55.70 .30	13.2 1.8	8.64 .59	44.3 2.0
Feb. 9.8	22.76 .91	47.1 1.2	37.68 .51	4.2 1.4	17.82 .34	36.1 0.8	56.00 .31	11.6 1.4	9.26 .63	42.6 1.4
19.8	23.68 .94	46.3 0.5	38.19 .52	3.1 0.7	18.17 .34	36.8 0.8	56.32 .31	10.4 1.0	9.91 .65	41.6 0.7
Mar. 1.8	24.62 .93	46.1 0.2	38.70 .51	2.8 0.0	18.51 .33	37.7 0.8	56.62 .30	9.7 0.5	10.56 .65	41.3 0.0
11.7	25.54 .90	46.6 0.8	39.21 .49	3.1 0.7	18.84 .32	38.4 0.8	56.92 .29	9.4 0.0	11.21 .63	41.6 0.7
21.7	26.41 .83	47.7 1.4	39.68 .46	4.1 1.3	19.15 .30	39.2 0.7	57.20 .27	9.7 0.5	11.82 .59	42.6 1.3
31.7	27.19 .74	49.5 2.0	40.12 .41	5.7 1.9	19.44 .28	39.8 0.6	57.47 .25	10.5 1.0	12.39 .53	44.2 1.9
Apr. 10.6	27.87 .62	51.7 2.5	40.51 .36	7.8 2.4	19.72 .26	40.5 0.6	57.71 .23	11.6 1.4	12.88 .46	46.3 2.4
20.6	28.43 .49	54.4 2.8	40.83 .30	10.4 2.8	19.97 .24	41.0 0.5	57.93 .20	13.2 1.7	13.30 .37	48.9 2.8
30.6	28.85 .34	57.4 3.1	41.10 .23	13.3 3.1	20.19 .21	41.5 0.5	58.12 .18	15.0 1.9	13.63 .28	51.9 3.1
May 10.6	29.12 .19	60.6 3.3	41.28 .15	16.4 3.3	20.39 .18	41.9 0.4	58.28 .15	17.1 2.1	13.86 .18	55.1 3.3
20.5	29.23 .03	64.0 3.3	41.40 .08	19.8 3.3	20.55 .15	42.4 0.4	58.41 .11	19.3 2.2	13.99 .08	58.4 3.4
30.5	29.19 .12	67.3 3.3	41.44 .00	23.1 3.3	20.68 .11	42.7 0.3	58.50 .08	21.5 2.3	14.01 .02	61.8 3.3
June 9.5	29.00 .27	70.5 3.1	41.40 .08	26.3 3.2	20.78 .08	43.0 0.3	58.56 .04	23.8 2.2	13.94 .12	65.1 3.2
19.5	28.66 .41	73.6 2.9	41.29 .15	29.4 3.0	20.84 .04	43.3 0.2	58.58 .00	26.0 2.1	13.77 .22	68.2 3.0
29.4	28.18 .54	76.3 2.6	41.11 .21	32.3 2.7	20.85 .00	43.6 0.2	58.57 .03	28.1 2.0	13.50 .31	71.1 2.7
July 9.4	27.59 .65	78.8 2.2	40.86 .27	34.8 2.3	20.83 .04	43.7 0.1	58.52 .07	29.9 1.8	13.15 .39	73.7 2.4
19.4	26.88 .75	80.8 1.8	40.56 .33	36.9 1.9	20.77 .08	43.8 0.1	58.44 .10	31.6 1.5	12.72 .46	75.8 2.0
29.3	26.08 .83	82.4 1.3	40.21 .38	38.7 1.5	20.68 .11	43.9 0.0	58.32 .13	33.0 1.2	12.22 .52	77.6 1.5
Aug. 8.3	25.21 .89	83.4 0.8	39.81 .42	39.9 1.0	20.55 .14	43.8 0.1	58.17 .16	34.1 0.9	11.67 .57	78.8 1.0
18.3	24.29 .94	84.0 0.3	39.38 .44	40.7 0.5	20.40 .16	43.6 0.2	58.01 .18	34.9 0.6	11.08 .61	79.6 0.5
28.3	23.33 .96	84.1 0.2	38.93 .46	40.9 0.0	20.23 .18	43.4 0.3	57.82 .19	35.4 0.3	10.46 .63	79.9 0.0
Sept. 7.2	22.37 .96	83.7 0.7	38.47 .46	40.6 0.5	20.05 .18	43.0 0.4	57.63 .19	35.5 0.0	9.82 .63	79.6 0.5
17.2	21.42 .94	82.7 1.2	38.01 .45	39.8 1.0	19.87 .18	42.5 0.5	57.43 .19	35.3 0.4	9.20 .62	78.8 1.0
27.2	20.50 .89	81.2 1.7	37.57 .42	38.5 1.5	19.69 .16	42.0 0.6	57.25 .18	34.7 0.7	8.59 .59	77.5 1.5
Oct. 7.2	19.65 .81	79.3 2.1	37.16 .38	36.7 2.0	19.54 .14	41.4 0.6	57.08 .16	33.8 1.1	8.02 .54	75.7 2.0
17.1	18.88 .71	76.9 2.6	36.80 .33	34.5 2.5	19.42 .10	40.7 0.6	56.94 .13	32.6 1.4	7.51 .47	73.5 2.5
27.1	18.23 .59	74.2 3.0	36.50 .27	31.8 2.9	19.34 .06	40.1 0.6	56.83 .09	31.0 1.7	7.08 .39	70.8 2.9
Nov. 6.1	17.70 .46	71.0 3.3	36.27 .19	28.8 3.2	19.31 .01	39.5 0.5	56.77 .04	29.1 2.0	6.73 .30	67.8 3.2
16.0	17.32 .30	67.7 3.5	36.12 .11	25.4 3.4	19.33 .05	39.0 0.4	56.75 .01	27.0 2.3	6.48 .19	64.4 3.4
26.0	17.10 .13	64.1 3.6	36.06 .02	21.9 3.6	19.40 .10	38.7 0.3	56.79 .06	24.6 2.5	6.35 .08	60.9 3.6
Dec. 6.0	17.06 .04	60.4 3.7	36.09 .08	18.2 3.7	19.53 .16	38.5 0.1	56.88 .11	22.0 2.6	6.34 .04	57.2 3.7
16.0	17.18 .22	56.8 3.6	36.21 .17	14.5 3.6	19.72 .21	38.5 0.1	57.01 .16	19.4 2.7	6.44 .16	53.5 3.6
25.9	17.49 .39	53.3 3.4	36.43 .26	11.0 3.5	19.94 .25	38.6 0.3	57.19 .20	16.7 2.7	6.67 .28	49.9 3.5
35.9	17.95 .55	50.0 3.1	36.72 .34	7.6 3.3	20.21 .29	39.0 0.4	57.42 .24	14.0 2.5	7.00 .39	46.5 3.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Ophiuchi.		α Triang. Australis.		η Herculis.		κ Ophiuchi.		ε Ursæ Minoris.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 16 31	° ′ −10 21	h m 16 38	° ′ −68 50	h m 16 39	° ′ +39 6	h m 16 52	° ′ + 9 31	h m 16 55	° ′ +82 11
	s	″	s	″	s	″	s	″	s	″
Jan. 0.9	39.08 .24	52.7 1.2	3.44 .56	30.1 1.9	27.20 .22	36.2 3.2	55.83 .21	46.3 2.1	60.71 .52	58.8 3.3
10.9	39.34 .27	53.9 1.2	4.04 .64	28.4 1.5	27.45 .27	33.2 2.9	56.06 .24	44.3 2.0	61.39 .83	55.6 3.0
20.9	39.62 .29	55.1 1.2	4.71 .70	27.0 1.1	27.73 .30	30.5 2.5	56.31 .26	42.4 1.8	62.35 1.09	52.8 2.6
30.8	39.92 .30	56.3 1.1	5.44 .74	26.1 0.7	28.05 .33	28.2 2.1	56.59 .28	40.6 1.6	63.55 1.30	50.4 2.1
Feb. 9.8	40.23 .31	57.3 1.0	6.20 .77	25.6 0.3	28.38 .34	26.3 1.6	56.88 .29	39.2 1.3	64.93 1.46	48.6 1.5
19.8	40.55 .31	58.3 0.9	6.97 .78	25.5 0.1	28.73 .35	25.0 1.0	57.17 .30	38.0 1.0	66.46 1.57	47.3 0.9
Mar. 1.8	40.85 .30	59.0 0.7	7.75 .77	25.9 0.5	29.08 .35	24.3 0.4	57.47 .30	37.2 0.6	68.06 1.62	46.7 0.3
11.7	41.15 .29	59.6 0.5	8.52 .75	26.6 0.9	29.42 .33	24.2 0.2	57.76 .29	36.8 0.2	69.68 1.60	46.8 0.4
21.7	41.44 .28	60.0 0.3	9.26 .72	27.7 1.2	29.74 .31	24.7 0.8	58.04 .28	36.8 0.2	71.25 1.53	47.5 1.0
31.7	41.71 .26	60.2 0.1	9.97 .68	29.1 1.5	30.05 .29	25.8 1.3	58.32 .26	37.2 0.6	72.72 1.41	48.8 1.6
Apr. 10.7	41.96 .24	60.2 0.1	10.63 .63	30.8 1.8	30.33 .26	27.4 1.8	58.57 .24	38.0 0.9	74.04 1.23	50.7 2.1
20.6	42.20 .22	60.0 0.3	11.22 .57	32.7 2.1	30.58 .23	29.4 2.2	58.80 .22	39.0 1.2	75.17 1.02	53.0 2.5
30.6	42.40 .20	59.6 0.4	11.76 .50	34.9 2.3	30.80 .20	31.8 2.5	59.02 .20	40.3 1.4	76.07 .77	55.8 2.9
May 10.6	42.59 .17	59.1 0.5	12.21 .42	37.2 2.4	30.98 .16	34.5 2.8	59.20 .17	41.9 1.6	76.71 .51	58.8 3.1
20.5	42.74 .14	58.6 0.6	12.58 .33	39.7 2.5	31.11 .12	37.4 2.9	59.36 .14	43.6 1.7	77.08 .23	62.1 3.3
30.5	42.87 .11	58.0 0.6	12.87 .24	42.2 2.5	31.21 .07	40.3 2.9	59.49 .11	45.3 1.8	77.16 .05	65.4 3.3
June 9.5	42.96 .07	57.3 0.6	13.05 .14	44.8 2.5	31.26 .03	43.2 2.9	59.58 .08	47.1 1.8	76.97 .33	68.6 3.2
19.5	43.02 .04	56.7 0.6	13.14 .04	47.2 2.4	31.26 .02	46.0 2.8	59.65 .04	48.8 1.7	76.50 .60	71.8 3.1
29.4	43.04 .00	56.1 0.6	13.12 .06	49.6 2.2	31.23 .06	48.7 2.6	59.67 .00	50.5 1.6	75.77 .85	74.8 2.9
July 9.4	43.02 .03	55.5 0.6	13.01 .16	51.7 2.0	31.14 .10	51.2 2.3	59.66 .03	52.1 1.5	74.80 1.08	77.5 2.5
19.4	42.97 .07	54.9 0.5	12.80 .25	53.7 1.7	31.02 .14	53.3 2.0	59.61 .07	53.5 1.3	73.62 1.29	79.8 2.1
29.4	42.89 .10	54.4 0.5	12.50 .34	55.3 1.4	30.86 .18	55.1 1.6	59.52 .10	54.7 1.1	72.24 1.46	81.8 1.7
Aug. 8.3	42.78 .13	53.9 0.5	12.12 .41	56.5 1.0	30.67 .21	56.5 1.2	59.41 .13	55.7 0.9	70.70 1.60	83.3 1.3
18.3	42.64 .15	53.5 0.4	11.68 .46	57.3 0.6	30.45 .23	57.5 0.8	59.27 .15	56.5 0.7	69.04 1.71	84.4 0.8
28.3	42.48 .16	53.1 0.3	11.20 .50	57.7 0.1	30.21 .25	58.1 0.4	59.11 .17	57.1 0.5	67.30 1.78	84.9 0.3
Sept. 7.2	42.32 .17	52.8 0.3	10.69 .52	57.6 0.3	29.95 .25	58.2 0.1	58.93 .18	57.4 0.2	65.50 1.81	85.0 0.2
17.2	42.15 .17	52.6 0.2	10.18 .50	57.0 0.8	29.70 .25	57.9 0.5	58.75 .18	57.5 0.1	63.70 1.79	84.6 0.7
27.2	41.99 .15	52.4 0.1	9.68 .47	55.9 1.3	29.45 .24	57.1 1.0	58.57 .17	57.4 0.3	61.93 1.74	83.6 1.2
Oct. 7.2	41.84 .13	52.3 0.0	9.24 .41	54.4 1.7	29.22 .22	55.9 1.4	58.41 .15	56.9 0.6	60.23 1.64	82.2 1.6
17.1	41.72 .10	52.3 0.1	8.87 .33	52.5 2.0	29.02 .19	54.2 1.9	58.27 .12	56.2 0.8	58.65 1.51	80.3 2.1
27.1	41.64 .06	52.4 0.2	8.58 .23	50.3 2.3	28.86 .14	52.2 2.3	58.16 .09	55.2 1.1	57.23 1.33	78.0 2.5
Nov. 6.1	41.60 .02	52.7 0.4	8.40 .12	47.9 2.5	28.74 .09	49.8 2.6	58.08 .05	54.0 1.3	56.01 1.11	75.2 2.9
16.1	41.61 .03	53.2 0.5	8.34 .00	45.3 2.6	28.67 .03	47.0 2.9	58.06 .00	52.6 1.6	55.03 .85	72.2 3.2
26.0	41.66 .08	53.8 0.7	8.41 .13	42.6 2.6	28.66 .02	44.0 3.1	58.08 .04	50.9 1.8	54.31 .57	68.9 3.4
Dec. 6.0	41.77 .13	54.5 0.9	8.61 .26	40.0 2.5	28.72 .08	40.8 3.2	58.15 .09	49.0 1.9	53.89 .27	65.5 3.5
16.0	41.93 .18	55.5 1.0	8.93 .38	37.6 2.3	28.83 .14	37.5 3.3	58.27 .14	47.0 2.0	53.78 .04	61.9 3.5
25.9	42.13 .22	56.5 1.1	9.36 .49	35.4 2.1	28.99 .19	34.2 3.2	58.43 .18	44.9 2.1	53.97 .35	58.4 3.4
35.9	42.36 .25	57.7 1.2	9.90 .59	33.4 1.8	29.21 .24	31.1 3.1	58.63 .22	42.8 2.1	54.48 .66	55.1 3.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.		*d* Herculis.		*η* Ophiuchi.		*a*¹ Herculis.		*π* Herculis.		*θ* Ophiuchi.	
		Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
		h m 16 57	° ′ +33 42	h m 17 4	° ′ −15 36	h m 17 10	° ′ +14 30	h m 17 11	° ′ +36 54	h m 17 15	° ′ −24 53
		s	″	s	″	s	″	s	″	s	″
Jan.	0.9	54.09 .20	40.4 3.0	38.44 .22	2.8 0.7	4.90 .19	12.2 2.3	32.95 .19	73.0 3.2	51.94 .23	56.6 0.1
	10.9	54.31 .24	37.5 2.8	38.68 .25	3.6 0.8	5.11 .22	10.0 2.2	33.16 .23	70.0 2.9	52.19 .26	56.8 0.2
	20.9	54.57 .27	34.8 2.5	38.95 .28	4.4 0.8	5.35 .25	7.8 2.0	33.41 .27	67.2 2.6	52.46 .29	57.0 0.3
	30.9	54.86 .30	32.5 2.1	39.24 .30	5.2 0.8	5.61 .27	6.0 1.7	33.69 .30	64.7 2.2	52.76 .31	57.4 0.4
Feb.	9.8	55.17 .32	30.6 1.7	39.54 .31	5.9 0.7	5.90 .29	4.4 1.4	34.00 .32	62.7 1.8	53.08 .32	57.8 0.4
	19.8	55.49 .33	29.2 1.2	39.85 .31	6.6 0.6	6.19 .30	3.1 1.0	34.33 .33	61.2 1.3	53.41 .33	58.1 0.4
Mar.	1.8	55.82 .33	28.3 0.6	40.17 .31	7.2 0.5	6.49 .30	2.3 0.6	34.66 .34	60.2 0.7	53.74 .33	58.5 0.4
	11.8	56.15 .32	28.0 0.0	40.48 .31	7.6 0.4	6.78 .29	1.9 0.2	35.00 .33	59.9 0.1	54.07 .33	58.8 0.3
	21.7	56.46 .31	28.4 0.6	40.78 .30	7.9 0.2	7.07 .28	1.9 0.2	35.33 .32	60.1 0.5	54.40 .32	59.2 0.3
	31.7	56.77 .29	29.2 1.1	41.07 .29	8.0 0.1	7.35 .27	2.4 0.7	35.64 .31	60.9 1.1	54.71 .31	59.4 0.2
Apr.	10.7	57.05 .27	30.6 1.6	41.35 .27	8.0 0.1	7.62 .26	3.2 1.1	35.94 .29	62.3 1.6	55.01 .29	59.6 0.2
	20.6	57.30 .24	32.4 2.0	41.61 .25	7.9 0.2	7.86 .24	4.5 1.4	36.21 .26	64.1 2.0	55.30 .28	59.7 0.1
	30.6	57.53 .21	34.6 2.3	41.85 .23	7.6 0.3	8.09 .21	6.0 1.6	36.46 .23	66.4 2.4	55.56 .25	59.8 0.1
May	10.6	57.72 .18	37.1 2.6	42.07 .20	7.3 0.4	8.29 .18	7.8 1.8	36.67 .19	68.9 2.7	55.80 .23	59.9 0.1
	20.6	57.88 .14	39.8 2.8	42.26 .17	6.9 0.4	8.46 .15	9.7 2.0	36.84 .15	71.7 2.9	56.02 .20	60.0 0.1
	30.5	58.00 .10	42.6 2.8	42.42 .14	6.5 0.4	8.60 .12	11.8 2.1	36.97 .11	74.6 3.0	56.20 .17	60.0 0.1
June	9.5	58.08 .06	45.4 2.8	42.55 .11	6.1 0.4	8.71 .09	13.8 2.1	37.06 .07	77.6 3.0	56.35 .13	60.1 0.1
	19.5	58.12 .02	48.1 2.7	42.64 .07	5.6 0.4	8.78 .06	15.9 2.0	37.11 .02	80.5 2.9	56.46 .09	60.2 0.1
	29.5	58.11 .03	50.8 2.5	42.69 .03	5.2 0.4	8.82 .02	17.8 1.9	37.11 .02	83.3 2.7	56.52 .05	60.4 0.1
July	9.4	58.06 .07	53.2 2.3	42.70 .01	4.9 0.4	8.81 .02	19.7 1.8	37.07 .07	85.9 2.5	56.55 .00	60.5 0.1
	19.4	57.97 .11	55.4 2.0	42.68 .05	4.5 0.3	8.77 .06	21.4 1.6	36.98 .11	88.2 2.2	56.53 .04	60.6 0.1
	29.4	57.84 .14	57.3 1.7	42.62 .08	4.2 0.3	8.69 .09	22.8 1.3	36.85 .15	90.3 1.9	56.48 .08	60.7 0.1
Aug.	8.3	57.68 .18	58.8 1.4	42.52 .11	3.9 0.3	8.58 .12	24.0 1.1	36.68 .18	92.0 1.5	56.38 .12	60.8 0.0
	18.3	57.48 .21	60.0 1.0	42.39 .14	3.6 0.3	8.44 .15	25.0 0.8	36.48 .21	93.3 1.1	56.25 .15	60.8 0.0
	28.3	57.27 .22	60.7 0.6	42.24 .16	3.4 0.3	8.27 .17	25.7 0.6	36.26 .23	94.2 0.7	56.09 .17	60.7 0.1
Sept.	7.3	57.04 .23	61.1 0.1	42.07 .17	3.1 0.2	8.09 .18	26.2 0.3	36.02 .25	94.7 0.3	55.91 .18	60.6 0.2
	17.2	56.80 .23	61.0 0.3	41.89 .18	2.9 0.2	7.90 .19	26.3 0.0	35.76 .25	94.8 0.2	55.72 .19	60.4 0.2
	27.2	56.57 .23	60.5 0.7	41.72 .17	2.7 0.2	7.72 .18	26.1 0.3	35.52 .24	94.4 0.6	55.54 .18	60.1 0.3
Oct.	7.2	56.35 .21	59.6 1.1	41.56 .15	2.5 0.2	7.54 .17	25.6 0.6	35.28 .23	93.5 1.1	55.36 .17	59.8 0.4
	17.2	56.16 .18	58.2 1.5	41.42 .12	2.3 0.1	7.38 .14	24.9 0.9	35.06 .20	92.2 1.5	55.21 .14	59.3 0.4
	27.1	56.00 .14	56.4 1.9	41.31 .09	2.3 0.0	7.26 .11	23.8 1.2	34.88 .16	90.5 1.9	55.09 .10	58.9 0.4
Nov.	6.1	55.88 .10	54.3 2.3	41.24 .05	2.3 0.1	7.17 .07	22.4 1.5	34.74 .12	88.4 2.3	55.01 .06	58.5 0.4
	16.1	55.81 .05	51.9 2.6	41.22 .00	2.4 0.2	7.12 .02	20.8 1.8	34.64 .07	85.9 2.6	54.98 .01	58.1 0.4
	26.0	55.79 .00	49.1 2.8	41.25 .05	2.6 0.3	7.12 .02	18.9 2.0	34.60 .01	83.1 2.9	54.99 .05	57.8 0.3
Dec.	6.0	55.83 .06	46.2 3.0	41.33 .10	3.0 0.4	7.17 .07	16.9 2.1	34.62 .04	80.1 3.1	55.07 .10	57.5 0.2
	16.0	55.92 .12	43.1 3.1	41.46 .15	3.4 0.5	7.26 .12	14.6 2.2	34.69 .10	77.0 3.2	55.19 .15	57.4 0.1
	26.0	56.06 .17	40.0 3.1	41.63 .19	4.0 0.6	7.41 .16	12.4 2.3	34.82 .15	73.8 3.2	55.37 .20	57.4 0.0
	35.9	56.26 .22	37.0 2.9	41.84 .23	4.8 0.7	7.59 .20	10.1 2.3	35.00 .20	70.7 3.1	55.58 .24	57.5 0.1

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*b* Ophiuchi.		δ Aræ.		β Draconis.		α Ophiuchi.		ι Herculis.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 17 20	° ′ −24 4	h m 17 22	° ′ −60 35	h m 17 28	° ′ +52 22	h m 17 30	° ′ +12 37	h m 17 36	° +46 3
	s	″	s	″	s	″	s	″	s	″
Jan. 1.0	15.61 .22	58.0 0.1	3.49 .36	55.8 1.9	8.70 .17	26.5 3.5	17.17 .18	56.0 2.2	37.23 .16	30.4 3.4
10.9	15.85 .25	58.1 0.2	3.88 .42	54.1 1.7	8.91 .23	23.1 3.2	17.37 .21	53.9 2.1	37.42 .21	27.2 3.2
20.9	16.12 .28	58.4 0.3	4.34 .48	52.5 1.4	9.17 .29	20.0 2.9	17.60 .24	51.8 1.9	37.65 .26	24.1 2.9
30.9	16.42 .31	58.8 0.4	4.84 .53	51.3 1.1	9.48 .34	17.2 2.5	17.84 .26	50.0 1.7	37.94 .30	21.4 2.5
Feb. 9.8	16.73 .32	59.2 0.4	5.38 .56	50.4 0.7	9.84 .38	15.0 2.0	18.12 .28	48.4 1.4	38.25 .33	19.1 2.0
19.8	17.06 .33	59.5 0.4	5.95 .58	49.8 0.4	10.22 .40	13.2 1.4	18.40 .29	47.2 1.1	38.60 .35	17.3 1.5
Mar. 1.8	17.38 .33	59.9 0.3	6.53 .58	49.6 0.1	10.62 .41	12.1 0.8	18.69 .29	46.3 0.7	38.96 .37	16.1 0.9
11.8	17.71 .33	60.2 0.3	7.12 .58	49.7 0.2	11.04 .41	11.6 0.1	18.99 .29	45.9 0.2	39.33 .37	15.6 0.2
21.7	18.04 .32	60.4 0.2	7.69 .57	50.0 0.5	11.45 .40	11.8 0.5	19.28 .29	45.8 0.2	39.70 .37	15.6 0.4
31.7	18.35 .31	60.6 0.2	8.25 .55	50.7 0.8	11.84 .39	12.6 1.1	19.56 .28	46.2 0.6	40.06 .35	16.3 1.0
Apr. 10.7	18.65 .29	60.8 0.1	8.79 .52	51.7 1.1	12.22 .36	14.0 1.7	19.84 .26	47.0 1.0	40.40 .33	17.6 1.6
20.7	18.94 .28	60.8 0.1	9.30 .49	52.9 1.3	12.56 .33	16.0 2.2	20.09 .25	48.2 1.3	40.72 .30	19.4 2.1
30.6	19.20 .26	60.9 0.0	9.77 .45	54.3 1.5	12.86 .29	18.4 2.6	20.33 .23	49.6 1.6	41.01 .27	21.8 2.5
May 10.6	19.45 .23	60.9 0.0	10.19 .40	55.9 1.7	13.12 .24	21.2 3.0	20.55 .20	51.3 1.8	41.27 .23	24.4 2.8
20.6	19.66 .20	60.9 0.0	10.55 .34	57.7 1.9	13.34 .18	24.3 3.2	20.74 .18	53.2 1.9	41.48 .19	27.4 3.1
30.5	19.85 .17	60.9 0.0	10.86 .27	59.6 2.0	13.49 .13	27.6 3.3	20.90 .14	55.2 2.0	41.64 .14	30.5 3.2
June 9.5	20.00 .13	61.0 0.0	11.10 .20	61.6 2.0	13.59 .07	30.9 3.3	21.03 .11	57.2 2.0	41.75 .09	33.8 3.2
19.5	20.11 .09	61.0 0.1	11.26 .13	63.7 2.0	13.63 .01	34.2 3.3	21.12 .07	59.2 2.0	41.82 .04	37.0 3.2
29.5	20.18 .05	61.1 0.1	11.35 .05	65.7 2.0	13.60 .05	37.4 3.1	21.18 .04	61.2 1.9	41.82 .02	40.1 3.1
July 9.4	20.22 .01	61.2 0.1	11.37 .03	67.7 1.9	13.52 .11	40.5 2.9	21.19 .00	63.0 1.8	41.78 .07	43.1 2.9
19.4	20.20 .03	61.2 0.1	11.30 .10	69.5 1.7	13.39 .16	43.2 2.6	21.17 .04	64.7 1.6	41.68 .12	45.8 2.6
29.4	20.15 .07	61.3 0.1	11.16 .17	71.2 1.5	13.19 .22	45.6 2.2	21.10 .08	66.2 1.4	41.54 .17	48.2 2.3
Aug. 8.4	20.05 .11	61.4 0.0	10.95 .24	72.6 1.2	12.95 .27	47.7 1.8	21.00 .12	67.4 1.2	41.35 .21	50.3 1.9
18.3	19.92 .14	61.4 0.0	10.68 .30	73.6 0.9	12.67 .30	49.3 1.4	20.88 .14	68.5 0.9	41.11 .25	52.0 1.5
28.3	19.77 .17	61.3 0.1	10.36 .34	74.4 0.5	12.35 .33	50.5 0.9	20.72 .17	69.3 0.6	40.85 .28	53.2 1.0
Sept. 7.3	19.60 .18	61.2 0.1	10.01 .36	74.7 0.1	12.01 .35	51.2 0.4	20.55 .18	69.8 0.4	40.56 .30	54.0 0.5
17.2	19.41 .19	61.0 0.2	9.63 .37	74.6 0.3	11.66 .36	51.4 0.1	20.36 .19	70.0 0.1	40.26 .30	54.3 0.0
27.2	19.22 .18	60.8 0.3	9.26 .36	74.1 0.7	11.30 .35	51.0 0.6	20.17 .19	69.9 0.2	39.96 .30	54.2 0.4
Oct. 7.2	19.04 .17	60.4 0.3	8.91 .34	73.2 1.1	10.96 .33	50.2 1.1	19.99 .17	69.6 0.5	39.66 .29	53.5 0.9
17.2	18.89 .14	60.1 0.4	8.60 .29	72.0 1.4	10.64 .30	48.9 1.6	19.83 .15	69.0 0.8	39.39 .26	52.3 1.4
27.1	18.77 .10	59.7 0.4	8.34 .23	70.3 1.7	10.36 .26	47.1 2.0	19.69 .12	68.0 1.1	39.14 .23	50.7 1.9
Nov. 6.1	18.68 .06	59.3 0.4	8.15 .15	68.4 2.0	10.12 .21	44.8 2.4	19.59 .08	66.8 1.5	38.94 .18	48.6 2.3
16.1	18.65 .01	59.0 0.3	8.04 .06	66.3 2.2	9.93 .15	42.1 2.8	19.53 .04	65.4 1.6	38.78 .13	46.1 2.7
26.1	18.66 .04	58.7 0.2	8.02 .03	64.1 2.3	9.82 .08	39.1 3.1	19.51 .01	63.7 1.8	38.68 .07	43.3 3.0
Dec. 6.0	18.73 .09	58.5 0.1	8.10 .12	61.8 2.3	9.76 .01	35.8 3.3	19.54 .06	61.8 2.0	38.64 .01	40.2 3.2
16.0	18.85 .14	58.4 0.0	8.28 .21	59.6 2.2	9.78 .06	32.4 3.5	19.62 .10	59.7 2.1	38.66 .06	36.9 3.3
26.0	19.02 .19	58.4 0.1	8.54 .30	57.5 2.0	9.88 .13	28.9 3.5	19.75 .15	57.6 2.2	38.75 .12	33.5 3.4
35.9	19.23 .23	58.6 0.2	8.88 .38	55.5 1.8	10.04 .19	25.4 3.4	19.91 .18	55.4 2.2	38.90 .18	30.2 3.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ω Draconis.		μ Herculis.		ψ^1 Draconis.		θ Herculis.		γ Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 17 37	° ′ +68 47	h m 17 42	° ′ +27 46	h m 17 43	° ′ +72 11	h m 17 52	° ′ +37 15	h m 17 54	° ′ +51 29
	s	″	s	″	s	″	s	″	s	″
Jan. 1.0	28.39 .17	70.8 3.6	32.01 .15	42.5 2.9	38.22 .15	49.2 3.7	48.46 .16	47.3 3.2	15.39 .13	59.9 3.4
10.9	28.62 .28	67.4 3.3	32.19 .19	39.7 2.7	38.44 .29	45.7 3.4	48.62 .19	44.2 3.0	15.55 .19	56.5 3.3
20.9	28.95 .38	64.2 3.0	32.40 .23	37.1 2.5	38.80 .42	42.4 3.1	48.83 .23	41.4 2.8	15.78 .25	53.3 3.0
30.9	29.38 .47	61.3 2.6	32.65 .26	34.8 2.2	39.28 .53	39.5 2.7	49.08 .26	38.7 2.4	16.05 .30	50.4 2.7
Feb. 9.9	29.90 .55	58.9 2.1	32.92 .28	32.7 1.8	39.86 .62	37.1 2.2	49.36 .29	36.5 2.0	16.38 .34	47.9 2.2
19.8	30.47 .61	57.1 1.5	33.21 .30	31.2 1.3	40.51 .68	35.2 1.6	49.66 .31	34.7 1.5	16.74 .37	45.9 1.7
Mar. 1.8	31.09 .64	55.9 0.9	33.51 .31	30.0 0.8	41.22 .73	33.9 1.0	49.98 .33	33.4 1.0	17.12 .39	44.6 1.1
11.8	31.73 .65	55.3 0.2	33.82 .31	29.5 0.3	41.96 .75	33.2 0.3	50.31 .33	32.8 0.4	17.52 .40	43.8 0.4
21.7	32.38 .64	55.4 0.5	34.13 .31	29.4 0.2	42.72 .74	33.3 0.4	50.64 .33	32.7 0.2	17.92 .40	43.7 0.2
31.7	33.00 .61	56.2 1.1	34.43 .30	29.9 0.7	43.45 .71	34.0 1.0	50.97 .32	33.2 0.8	18.32 .39	44.3 0.9
Apr. 10.7	33.60 .57	57.7 1.7	34.72 .28	30.9 1.2	44.14 .66	35.3 1.6	51.29 .31	34.3 1.3	18.70 .37	45.4 1.5
20.7	34.13 .51	59.7 2.2	35.00 .27	32.4 1.7	44.78 .59	37.2 2.2	51.59 .29	35.9 1.8	19.07 .35	47.2 2.0
30.6	34.60 .43	62.1 2.7	35.26 .24	34.3 2.0	45.33 .51	39.6 2.6	51.87 .27	37.9 2.2	19.39 .31	49.4 2.5
May 10.6	34.99 .35	65.0 3.0	35.49 .21	36.5 2.3	45.79 .41	42.5 3.0	52.12 .23	40.4 2.6	19.68 .27	52.1 2.8
20.6	35.29 .26	68.2 3.3	35.69 .18	38.9 2.5	46.14 .30	45.6 3.2	52.34 .20	43.1 2.8	19.93 .22	55.1 3.1
30.6	35.50 .16	71.6 3.4	35.85 .15	41.5 2.6	46.38 .18	48.9 3.4	52.52 .16	46.0 3.0	20.12 .17	58.3 3.3
June 9.5	35.60 .05	75.0 3.5	35.98 .11	44.2 2.7	46.50 .06	52.4 3.4	52.66 .12	49.0 3.0	20.26 .11	61.6 3.4
19.5	35.60 .05	78.5 3.4	36.07 .07	46.9 2.7	46.50 .07	55.8 3.4	52.75 .07	52.1 3.0	20.34 .05	65.0 3.3
29.5	35.50 .15	81.8 3.3	36.12 .03	49.5 2.6	46.37 .19	59.2 3.3	52.79 .02	55.1 2.9	20.35 .01	68.3 3.2
July 9.4	35.29 .25	85.0 3.1	36.12 .02	52.0 2.4	46.13 .30	62.4 3.1	52.79 .03	57.9 2.8	20.31 .07	71.5 3.0
19.4	34.99 .34	87.9 2.8	36.09 .06	54.3 2.2	45.77 .41	65.3 2.8	52.74 .07	60.6 2.5	20.21 .13	74.4 2.8
29.4	34.61 .42	90.5 2.4	36.01 .10	56.3 1.9	45.31 .51	67.9 2.4	52.65 .12	63.0 2.2	20.05 .18	77.1 2.5
Aug. 8.4	34.15 .49	92.7 2.0	35.89 .14	58.1 1.6	44.76 .59	70.2 2.0	52.51 .16	65.1 1.9	19.84 .23	79.4 2.1
18.3	33.62 .55	94.5 1.6	35.73 .17	59.5 1.3	44.12 .66	72.0 1.6	52.33 .19	66.8 1.5	19.59 .27	81.3 1.7
28.3	33.04 .60	95.8 1.1	35.55 .19	60.6 0.9	43.43 .72	73.4 1.1	52.12 .22	68.1 1.1	19.30 .31	82.8 1.3
Sept. 7.3	32.42 .63	96.6 0.6	35.35 .21	61.3 0.5	42.69 .76	74.2 0.6	51.89 .24	69.0 0.7	18.97 .33	83.8 0.8
17.3	31.77 .65	96.9 0.0	35.13 .22	61.6 0.1	41.92 .77	74.6 0.1	51.64 .25	69.5 0.2	18.63 .35	84.4 0.3
27.2	31.12 .64	96.7 0.5	34.91 .22	61.6 0.3	41.14 .77	74.4 0.4	51.38 .25	69.5 0.2	18.28 .35	84.4 0.2
Oct. 7.2	30.49 .62	95.9 1.0	34.69 .21	61.1 0.7	40.37 .75	73.7 1.0	51.13 .24	69.1 0.7	17.94 .34	83.9 0.7
17.2	29.89 .58	94.6 1.5	34.49 .19	60.2 1.1	39.64 .70	72.5 1.5	50.89 .22	68.2 1.1	17.61 .31	82.9 1.2
27.1	29.34 .52	92.8 2.0	34.32 .16	59.0 1.4	38.96 .64	70.8 2.0	50.68 .19	66.9 1.5	17.31 .28	81.4 1.7
Nov. 6.1	28.85 .44	90.6 2.5	34.18 .12	57.3 1.8	38.36 .55	68.6 2.4	50.50 .16	65.1 2.0	17.06 .23	79.5 2.2
16.1	28.45 .35	87.9 2.9	34.08 .08	55.3 2.1	37.86 .45	66.0 2.8	50.37 .11	63.0 2.3	16.85 .18	77.1 2.6
26.1	28.15 .25	84.8 3.2	34.03 .03	53.0 2.4	37.46 .33	63.0 3.1	50.28 .06	60.5 2.6	16.70 .12	74.3 3.0
Dec. 6.0	27.95 .14	81.5 3.4	34.03 .02	50.5 2.6	37.19 .20	59.7 3.4	50.25 .00	57.7 2.9	16.62 .05	71.2 3.2
16.0	27.87 .02	78.0 3.6	34.08 .07	47.8 2.8	37.06 .07	56.2 3.5	50.27 .05	54.7 3.0	16.60 .02	67.9 3.4
26.0	27.91 .10	74.4 3.6	34.18 .12	45.0 2.8	37.06 .07	52.7 3.6	50.35 .10	51.6 3.1	16.65 .09	64.4 3.4
36.0	28.07 .22	70.9 3.5	34.32 .17	42.2 2.7	37.20 .20	49.1 3.7	50.48 .15	48.5 3.1	16.77 .15	61.0 3.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ^2 Sagittarii.		*o* Herculis.		μ Sagittarii.		η Serpentis.		λ Sagittarii.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*
	h m 17 59	° ′ −30 25	h m 18 3	° ′ +28 44	h m 18 7	° ′ −21 5	h m 18 16	° ′ − 2 55	h m 18 21	° ′ −25 28
	s	″	s	″	s	″	s	″	s	″
Jan. 1.0	22.80 .20	30.0 0.4	37.78 .13	54.4 2.9	46.78 .18	4.2 0.1	7.85 .15	27.5 1.3	47.75 .16	35.2 0.2
11.0	23.01 .23	29.6 0.4	37.93 .17	51.6 2.7	46.97 .21	4.3 0.2	8.01 .18	28.7 1.2	47.93 .20	35.0 0.2
20.9	23.26 .26	29.3 0.3	38.13 .21	49.0 2.5	47.19 .24	4.4 0.2	8.20 .21	29.9 1.1	48.15 .23	34.9 0.2
30.9	23.54 .29	29.0 0.2	38.36 .24	46.6 2.3	47.44 .26	4.6 0.2	8.42 .23	31.0 1.0	48.40 .26	34.8 0.1
Feb. 9.9	23.85 .31	28.8 0.2	38.61 .27	44.5 1.9	47.72 .28	4.8 0.1	8.67 .25	31.9 0.9	48.67 .28	34.6 0.1
19.8	24.17 .33	28.7 0.1	38.89 .29	42.8 1.4	48.01 .30	4.9 0.1	8.93 .27	32.7 0.7	48.96 .30	34.5 0.1
Mar. 1.8	24.50 .34	28.6 0.1	39.19 .30	41.6 0.9	48.32 .31	5.0 0.0	9.21 .28	33.2 0.4	49.27 .31	34.3 0.2
11.8	24.84 .34	28.5 0.1	39.50 .31	40.9 0.4	48.63 .32	4.9 0.1	9.49 .29	33.5 0.1	49.59 .32	34.1 0.2
21.8	25.19 .34	28.4 0.1	39.81 .31	40.8 0.1	48.95 .32	4.8 0.1	9.78 .29	33.5 0.1	49.92 .33	33.9 0.3
31.7	25.53 .34	28.4 0.1	40.12 .31	41.2 0.7	49.26 .31	4.6 0.2	10.08 .29	33.2 0.4	50.24 .33	33.6 0.3
Apr. 10.7	25.86 .33	28.3 0.0	40.42 .30	42.1 1.2	49.58 .31	4.4 0.3	10.36 .28	32.7 0.7	50.57 .32	33.3 0.3
20.7	26.18 .32	28.3 0.0	40.71 .28	43.5 1.6	49.88 .30	4.0 0.4	10.64 .27	31.9 0.9	50.89 .31	33.0 0.3
30.7	26.49 .30	28.3 0.0	40.98 .26	45.4 2.0	50.17 .28	3.6 0.4	10.91 .26	30.9 1.1	51.19 .30	32.6 0.3
May 10.6	26.78 .28	28.3 0.1	41.23 .23	47.6 2.3	50.44 .26	3.2 0.4	11.16 .24	29.8 1.2	51.48 .28	32.3 0.3
20.6	27.04 .25	28.4 0.1	41.45 .20	50.0 2.6	50.69 .24	2.8 0.4	11.40 .22	28.5 1.3	51.75 .26	32.0 0.3
30.6	27.28 .22	28.6 0.2	41.64 .17	52.7 2.7	50.91 .21	2.4 0.4	11.60 .19	27.2 1.3	51.99 .23	31.8 0.2
June 9.5	27.47 .18	28.8 0.3	41.79 .13	55.4 2.8	51.10 .17	2.1 0.3	11.78 .16	25.8 1.3	52.20 .19	31.6 0.1
19.5	27.63 .14	29.1 0.3	41.90 .09	58.2 2.8	51.26 .14	1.8 0.3	11.93 .13	24.5 1.3	52.38 .15	31.6 0.0
29.5	27.75 .09	29.5 0.4	41.97 .05	61.0 2.7	51.38 .09	1.6 0.2	12.04 .09	23.2 1.2	52.51 .11	31.6 0.0
July 9.5	27.82 .05	29.9 0.4	41.99 .00	63.6 2.5	51.45 .05	1.4 0.1	12.10 .05	22.0 1.1	52.60 .07	31.6 0.1
19.4	27.84 .00	30.3 0.4	41.97 .04	66.1 2.3	51.48 .01	1.3 0.1	12.13 .01	20.9 1.0	52.64 .02	31.8 0.2
29.4	27.82 .05	30.7 0.4	41.91 .08	68.3 2.1	51.46 .04	1.3 0.0	12.11 .03	20.0 0.9	52.64 .03	32.0 0.2
Aug. 8.4	27.74 .09	31.1 0.4	41.80 .12	70.3 1.8	51.40 .08	1.3 0.0	12.06 .07	19.2 0.7	52.59 .07	32.2 0.2
18.4	27.63 .13	31.5 0.3	41.66 .16	71.9 1.5	51.30 .12	1.3 0.0	11.97 .11	18.5 0.6	52.50 .11	32.4 0.2
28.3	27.48 .16	31.8 0.2	41.49 .19	73.2 1.1	51.17 .14	1.3 0.0	11.84 .14	18.0 0.4	52.37 .14	32.6 0.2
Sept. 7.3	27.31 .19	32.0 0.1	41.29 .21	74.1 0.7	51.01 .17	1.3 0.0	11.69 .16	17.6 0.3	52.21 .17	32.8 0.1
17.3	27.11 .20	32.0 0.0	41.07 .22	74.7 0.3	50.84 .18	1.3 0.0	11.52 .17	17.4 0.2	52.03 .19	33.0 0.1
27.2	26.91 .20	32.0 0.1	40.85 .22	74.8 0.1	50.65 .18	1.3 0.1	11.34 .18	17.3 0.0	51.84 .19	33.0 0.0
Oct. 7.2	26.71 .19	31.8 0.3	40.62 .21	74.5 0.5	50.47 .18	1.2 0.1	11.17 .17	17.4 0.1	51.65 .19	33.0 0.1
17.2	26.53 .17	31.4 0.4	40.42 .20	73.8 0.9	50.30 .16	1.1 0.1	11.00 .16	17.6 0.3	51.47 .17	32.8 0.2
27.2	26.37 .14	31.0 0.5	40.23 .17	72.7 1.3	50.15 .13	0.9 0.2	10.85 .13	17.9 0.4	51.31 .14	32.6 0.2
Nov. 6.1	26.26 .10	30.5 0.6	40.07 .14	71.3 1.7	50.03 .10	0.8 0.1	10.73 .10	18.4 0.6	51.18 .11	32.4 0.3
16.1	26.18 .05	29.9 0.6	39.96 .10	69.4 2.0	49.96 .05	0.6 0.1	10.65 .06	19.1 0.7	51.09 .07	32.0 0.3
26.1	26.15 .00	29.3 0.6	39.88 .05	67.3 2.3	49.92 .01	0.5 0.1	10.61 .02	19.9 0.9	51.05 .02	31.7 0.3
Dec. 6.1	26.18 .05	28.6 0.6	39.86 .00	64.8 2.5	49.94 .04	0.4 0.0	10.61 .02	20.9 1.0	51.05 .03	31.4 0.3
16.0	26.26 .11	28.1 0.5	39.88 .05	62.2 2.7	50.01 .09	0.4 0.0	10.66 .07	22.0 1.1	51.11 .08	31.1 0.3
26.0	26.40 .16	27.6 0.5	39.96 .10	59.4 2.8	50.13 .14	0.5 0.1	10.75 .11	23.1 1.2	51.21 .13	30.8 0.2
36.0	26.58 .20	27.1 0.4	40.08 .14	56.6 2.9	50.29 .19	0.6 0.1	10.88 .15	24.3 1.3	51.36 .18	30.6 0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	χ Draconis.		ι Aquilæ.		ζ Pavonis.		α Lyræ. (*Vega.*)		β Lyræ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 18 22	° ′ +72 41	h m 18 29	° ′ − 8 18	h m 18 31	° ′ −71 30	h m 18 33	° ′ +38 41	h m 18 46	° ′ +33 14
	s	″	s	″	s	″	s	″	s	″
Jan. 1.0	46.75 .02	23.0 3.4	45.69 .14	48.8 0.8	19.16 .30	45.9 2.8	32.14 .09	27.3 3.1	22.44 .08	49.8 2.9
11.0	46.86 .18	19.5 3.4	45.84 .17	49.7 0.8	19.52 .42	43.2 2.7	32.26 .14	24.3 3.0	22.54 .13	46.9 2.8
21.0	47.11 .32	16.1 3.3	46.03 .20	50.5 0.8	20.00 .53	40.6 2.5	32.42 .18	21.3 2.9	22.69 .18	44.1 2.7
30.9	47.50 .44	13.0 3.0	46.25 .23	51.2 0.7	20.58 .62	38.2 2.3	32.63 .23	18.5 2.6	22.88 .21	41.5 2.5
Feb. 9.9	47.99 .55	10.2 2.5	46.49 .25	51.9 0.6	21.25 .70	36.0 2.0	32.87 .26	16.1 2.2	23.11 .24	39.2 2.2
19.9	48.60 .64	7.9 2.0	46.75 .27	52.4 0.4	21.99 .76	34.2 1.6	33.15 .29	14.0 1.8	23.36 .27	37.2 1.8
Mar. 1.8	49.27 .71	6.1 1.4	47.02 .28	52.7 0.2	22.79 .81	32.8 1.3	33.46 .31	12.5 1.2	23.64 .29	35.7 1.3
11.8	50.01 .75	5.0 0.8	47.31 .29	52.8 0.0	23.62 .84	31.6 0.9	33.78 .33	11.5 0.7	23.94 .31	34.7 0.7
21.8	50.77 .77	4.5 0.1	47.60 .30	52.7 0.2	24.47 .86	30.9 0.5	34.11 .34	11.1 0.1	24.26 .32	34.2 0.2
31.8	51.54 .76	4.7 0.5	47.90 .30	52.4 0.4	25.34 .86	30.6 0.1	34.45 .34	11.3 0.6	24.58 .32	34.4 0.4
Apr. 10.7	52.30 .73	5.6 1.2	48.20 .29	51.9 0.6	26.19 .85	30.6 0.3	34.78 .33	12.1 1.1	24.90 .32	35.1 1.0
20.7	53.01 .68	7.0 1.8	48.48 .28	51.1 0.8	27.03 .82	31.1 0.6	35.11 .32	13.5 1.6	25.21 .30	36.3 1.5
30.7	53.66 .61	9.1 2.3	48.76 .27	50.2 0.9	27.82 .77	31.9 1.0	35.42 .30	15.3 2.1	25.52 .29	38.0 1.9
May 10.6	54.22 .52	11.6 2.7	49.03 .26	49.2 1.0	28.57 .71	33.0 1.3	35.71 .27	17.6 2.4	25.80 .27	40.1 2.3
20.6	54.70 .42	14.4 3.0	49.28 .24	48.2 1.1	29.25 .64	34.5 1.6	35.97 .24	20.2 2.7	26.06 .25	42.6 2.6
30.6	55.06 .30	17.6 3.3	49.50 .21	47.0 1.1	29.85 .55	36.3 1.9	36.19 .20	23.1 3.0	26.29 .21	45.3 2.8
June 9.6	55.30 .18	21.0 3.4	49.70 .18	45.9 1.1	30.36 .45	38.3 2.1	36.38 .16	26.2 3.1	26.49 .17	48.2 2.9
19.5	55.42 .06	24.5 3.5	49.86 .14	44.8 1.1	30.76 .34	40.6 2.3	36.52 .11	29.4 3.1	26.64 .13	51.2 3.0
29.5	55.41 .07	28.0 3.4	49.99 .10	43.8 1.0	31.04 .23	43.0 2.4	36.61 .07	32.5 3.1	26.76 .09	54.2 3.0
July 9.5	55.27 .20	31.4 3.3	50.07 .06	42.9 0.9	31.21 .10	45.4 2.4	36.65 .02	35.6 3.0	26.82 .04	57.2 2.9
19.5	55.02 .32	34.6 3.1	50.12 .02	42.0 0.8	31.25 .02	47.8 2.4	36.64 .03	38.5 2.8	26.83 .01	60.0 2.7
29.4	54.64 .43	37.6 2.9	50.12 .02	41.3 0.6	31.16 .15	50.2 2.3	36.58 .08	41.2 2.6	26.80 .06	62.6 2.5
Aug. 8.4	54.16 .53	40.4 2.5	50.07 .06	40.7 0.5	30.95 .27	52.4 2.1	36.48 .13	43.7 2.3	26.72 .10	65.0 2.2
18.4	53.59 .61	42.7 2.1	49.99 .10	40.2 0.4	30.63 .37	54.4 1.8	36.32 .17	45.8 1.9	26.60 .14	67.1 1.9
28.4	52.94 .69	44.6 1.7	49.88 .13	39.9 0.3	30.21 .46	56.0 1.5	36.13 .20	47.6 1.5	26.44 .18	68.8 1.6
Sept. 7.3	52.21 .74	46.1 1.2	49.73 .15	39.6 0.2	29.70 .53	57.3 1.1	35.91 .23	48.9 1.1	26.24 .21	70.2 1.2
17.3	51.45 .78	47.0 0.7	49.57 .17	39.5 0.1	29.13 .58	58.1 0.6	35.67 .25	49.8 0.7	26.03 .23	71.2 0.8
27.3	50.66 .79	47.5 0.2	49.39 .18	39.4 0.0	28.53 .61	58.5 0.1	35.41 .26	50.3 0.2	25.80 .24	71.7 0.3
Oct. 7.2	49.86 .79	47.4 0.3	49.22 .17	39.5 0.1	27.91 .60	58.3 0.4	35.15 .26	50.3 0.2	25.56 .24	71.8 0.1
17.2	49.08 .76	46.8 0.9	49.05 .16	39.6 0.2	27.32 .57	57.7 0.9	34.90 .25	49.9 0.7	25.32 .23	71.5 0.5
27.2	48.33 .71	45.7 1.4	48.90 .14	39.8 0.3	26.77 .51	56.5 1.4	34.66 .22	49.0 1.1	25.11 .21	70.7 1.0
Nov. 6.2	47.65 .64	44.0 1.9	48.77 .11	40.2 0.4	26.30 .42	54.9 1.8	34.45 .19	47.6 1.6	24.92 .18	69.6 1.4
16.1	47.05 .55	41.9 2.4	48.68 .07	40.6 0.5	25.93 .31	52.9 2.1	34.28 .15	45.8 2.0	24.75 .14	68.0 1.8
26.1	46.54 .45	39.3 2.8	48.63 .03	41.1 0.6	25.67 .19	50.5 2.5	34.15 .10	43.6 2.4	24.63 .10	66.0 2.1
Dec. 6.1	46.16 .32	36.4 3.1	48.63 .02	41.7 0.7	25.54 .06	47.9 2.7	34.08 .05	41.0 2.7	24.56 .05	63.7 2.4
16.0	45.90 .19	33.1 3.3	48.67 .06	42.4 0.8	25.54 .07	45.2 2.8	34.05 .00	38.2 2.9	24.53 .00	61.1 2.7
26.0	45.78 .05	29.7 3.5	48.75 .10	43.2 0.8	25.68 .21	42.3 2.8	34.08 .06	35.2 3.0	24.56 .05	58.3 2.8
36.0	45.80 .10	26.1 3.7	48.88 .15	44.1 0.8	25.96 .34	39.5 2.8	34.16 .11	32.2 3.1	24.63 .10	55.4 2.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Sagittarii.		50 Draconis.		γ Lyræ.		σ Octantis.		ζ Aquilæ.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 18 49	° ′ −26 25	h m 18 49	° ′ +75 18	h m 18 55	° ′ +32 32	h 18	° ′ −89 14	h m 19 0	° ′ +13 42
	s	″	s	″	s	″	m s	″	s	″
Jan. 1.0	3.64 .13	13.7 0.4	30.25 .07	61.5 3.4	11.36 .07	71.3 2.9	58 32.0 3.1	74.3 3.6	48.41 .09	55.8 2.0
11.0	3.79 .17	13.3 0.4	30.26 .09	58.1 3.4	11.45 .12	68.5 2.8	58 36.4 6.0	70.8 3.5	48.52 .12	53.8 2.0
21.0	3.98 .21	13.0 0.4	30.43 .26	54.7 3.3	11.59 .16	65.7 2.7	58 43.8 8.9	67.4 3.3	48.66 .16	51.8 1.9
30.9	4.20 .24	12.6 0.4	30.77 .41	51.4 3.1	11.77 .20	63.1 2.5	58 54.1 11.6	64.2 3.0	48.83 .19	50.0 1.7
Feb. 9.9	4.46 .26	12.2 0.4	31.26 .55	48.5 2.8	11.99 .23	60.8 2.2	59 6.9 13.9	61.4 2.7	49.04 .22	48.4 1.5
19.9	4.74 .29	11.9 0.4	31.87 .67	46.0 2.3	12.24 .26	58.8 1.8	59 21.8 15.8	58.8 2.4	49.27 .24	47.1 1.2
Mar. 1.9	5.03 .31	11.5 0.4	32.60 .77	44.0 1.7	12.51 .28	57.2 1.3	59 38.4 17.4	56.7 1.9	49.52 .26	46.1 0.8
11.8	5.34 .32	11.0 0.4	33.41 .84	42.5 1.2	12.80 .30	56.2 0.8	59 56.4 18.4	55.0 1.5	49.79 .28	45.4 0.4
21.8	5.66 .32	10.5 0.5	34.27 .88	41.7 0.5	13.11 .31	55.7 0.2	60 15.2 19.1	53.7 1.0	50.07 .29	45.2 0.0
31.8	5.99 .33	10.0 0.5	35.16 .89	41.5 0.2	13.43 .32	55.8 0.4	60 34.6 19.4	52.9 0.5	50.36 .29	45.5 0.4
Apr. 10.7	6.32 .33	9.5 0.5	36.05 .88	42.0 0.8	13.75 .32	56.4 0.9	60 53.9 19.3	52.6 0.0	50.65 .29	46.1 0.8
20.7	6.64 .32	9.0 0.5	36.90 .84	43.2 1.4	14.06 .31	57.6 1.4	61 12.9 18.7	52.8 0.5	50.94 .29	47.2 1.2
30.7	6.96 .31	8.4 0.5	37.70 .76	44.9 2.0	14.37 .30	59.2 1.9	61 31.2 17.8	53.5 0.9	51.23 .28	48.6 1.5
May 10.7	7.27 .30	7.9 0.4	38.41 .66	47.2 2.5	14.66 .28	61.3 2.3	61 48.4 16.5	54.6 1.3	51.50 .27	50.3 1.8
20.6	7.56 .28	7.5 0.4	39.02 .55	49.8 2.8	14.93 .25	63.7 2.6	62 4.1 14.9	56.1 1.7	51.76 .25	52.2 2.0
30.6	7.83 .25	7.2 0.3	39.51 .42	52.9 3.1	15.17 .22	66.4 2.8	62 18.0 12.9	58.1 2.0	51.99 .22	54.4 2.2
June 9.6	8.06 .22	6.9 0.2	39.86 .28	56.2 3.4	15.37 .18	69.3 2.9	62 29.8 10.6	60.3 2.4	52.20 .19	56.6 2.3
19.6	8.26 .18	6.7 0.1	40.08 .14	59.6 3.5	15.54 .14	72.3 3.0	62 39.2 8.1	62.9 2.7	52.37 .16	58.9 2.3
29.5	8.43 .14	6.7 0.0	40.14 .01	63.1 3.5	15.66 .10	75.3 3.0	62 45.9 5.4	65.7 2.9	52.51 .12	61.1 2.2
July 9.5	8.54 .10	6.8 0.1	40.06 .15	66.6 3.5	15.73 .05	78.2 2.9	62 49.8 2.5	68.6 3.0	52.61 .08	63.3 2.1
19.5	8.62 .05	6.9 0.2	39.83 .30	70.0 3.3	15.76 .00	81.1 2.8	62 50.8 0.5	71.6 3.0	52.66 .03	65.4 2.0
29.4	8.64 .00	7.2 0.3	39.46 .44	73.3 3.1	15.73 .05	83.7 2.6	62 48.7 3.5	74.5 2.9	52.67 .01	67.3 1.8
Aug. 8.4	8.61 .05	7.5 0.3	38.96 .57	76.2 2.8	15.66 .09	86.1 2.3	62 43.7 6.4	77.3 2.7	52.64 .05	69.0 1.6
18.4	8.54 .09	7.8 0.3	38.34 .68	78.9 2.5	15.55 .13	88.3 2.0	62 36.0 9.1	79.9 2.4	52.56 .09	70.5 1.4
28.4	8.43 .13	8.2 0.3	37.61 .77	81.2 2.1	15.40 .17	90.0 1.6	62 25.7 11.5	82.2 2.0	52.45 .12	71.7 1.1
Sept. 7.3	8.28 .16	8.5 0.3	36.80 .85	83.0 1.6	15.21 .20	91.5 1.2	62 13.2 13.5	84.0 1.6	52.31 .15	72.7 0.8
17.3	8.11 .18	8.7 0.2	35.92 .91	84.4 1.2	15.00 .22	92.5 0.8	61 58.9 15.0	85.3 1.1	52.15 .17	73.4 0.5
27.3	7.92 .19	8.9 0.1	35.00 .94	85.3 0.7	14.78 .23	93.2 0.4	61 43.4 16.0	86.1 0.5	51.97 18	73.8 0.2
Oct. 7.3	7.73 .19	9.0 0.0	34.06 .95	85.7 0.1	14.54 .23	93.4 0.0	61 27.2 16.3	86.3 0.1	51.78 .19	73.9 0.1
17.2	7.54 .18	9.0 0.1	33.11 .93	85.6 0.4	14.31 .22	93.1 0.5	61 11.0 16.0	85.9 0.7	51.59 .18	73.7 0.3
27.2	7.37 .16	8.9 0.1	32.20 .89	84.9 1.0	14.09 .21	92.4 0.9	60 55.3 15.1	84.9 1.3	51.42 .16	73.2 0.6
Nov. 6.2	7.22 .13	8.7 0.2	31.34 .83	83.6 1.5	13.90 .18	91.4 1.3	60 41.0 13.6	83.2 1.9	51.26 .13	72.4 0.9
16.1	7.11 .09	8.4 0.3	30.56 .73	81.9 2.0	13.74 .14	89.8 1.7	60 28.4 11.4	81.1 2.4	51.14 .10	71.3 1.2
26.1	7.04 .05	8.1 0.3	29.88 .62	79.7 2.5	13.61 .10	88.0 2.1	60 18.3 8.8	78.4 2.8	51.05 .07	70.0 1.5
Dec. 6.1	7.02 .00	7.8 0.4	29.33 .49	77.0 2.9	13.53 .06	85.7 2.4	60 10.9 5.9	75.4 3.1	51.00 .03	68.4 1.7
16.1	7.05 .05	7.4 0.4	28.91 .34	74.0 3.2	13.50 .01	83.2 2.6	60 6.5 2.7	72.1 3.4	51.00 .01	66.7 1.8
26.0	7.12 .10	7.0 0.4	28.65 .18	70.7 3.3	13.51 .04	80.5 2.8	60 5.5 0.6	68.7 3.5	51.03 .06	64.8 1.9
36.0	7.25 .14	6.6 0.4	28.56 .01	67.3 3.4	13.57 .09	77.7 2.9	60 7.6 4.0	65.2 3.5	51.11 .10	62.8 2.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*ι* Lyræ.		*d* Sagittarii.		*δ* Draconis.		*θ* Lyræ.		*τ* Draconis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 19 3	° ′ +35 56	h m 19 11	° ′ −19 7	h m 19 12	° ′ +67 28	h m 19 12	° ′ +37 57	h m 19 17	° ′ +73 9
	s	″	s	″	s	″	s	″	s	″
Jan. 1.0	43.13 .06	39.4 2.9	46.86 .10	49.5 0.0	28.61 .06	74.6 3.4	52.87 .04	24.9 2.9	23.92 .14	78.8 3.3
11.0	43.21 .11	36.5 2.9	46.98 .14	49.5 0.0	28.60 .05	71.2 3.4	52.94 .09	22.0 2.9	23.85 .00	75.4 3.4
21.0	43.34 .15	33.6 2.8	47.13 .17	49.5 0.0	28.70 .15	67.7 3.4	53.05 .14	19.0 2.9	23.92 .15	72.0 3.4
30.9	43.51 .19	30.8 2.6	47.32 .20	49.4 0.1	28.90 .26	64.4 3.2	53.21 .18	16.2 2.7	24.14 .28	68.7 3.2
Feb. 9.9	43.72 .23	28.4 2.3	47.54 .23	49.3 0.1	29.21 .35	61.4 2.9	53.42 .22	13.7 2.4	24.50 .41	65.6 2.9
19.9	43.96 .26	26.3 1.9	47.79 .25	49.2 0.2	29.60 .43	58.7 2.5	53.66 .26	11.5 2.0	24.98 .53	62.8 2.5
Mar. 1.9	44.24 .29	24.6 1.4	48.05 .27	48.9 0.3	30.07 .50	56.4 2.0	53.93 .29	9.7 1.5	25.56 .63	60.5 2.0
11.8	44.54 .31	23.4 0.9	48.34 .29	48.5 0.4	30.60 .55	54.8 1.4	54.22 .31	8.5 1.0	26.23 .70	58.8 1.5
21.8	44.85 .32	22.8 0.3	48.63 .30	48.0 0.6	31.18 .59	53.7 0.7	54.54 .32	7.8 0.4	26.97 .76	57.6 0.8
31.8	45.18 .33	22.8 0.3	48.94 .31	47.4 0.7	31.78 .61	53.3 0.1	54.87 .33	7.6 0.2	27.74 .78	57.1 0.2
Apr. 10.8	45.51 .33	23.4 0.8	49.25 .31	46.6 0.8	32.40 .61	53.6 0.6	55.21 .34	8.1 0.8	28.54 .78	57.3 0.5
20.7	45.83 .32	24.5 1.4	49.56 .31	45.8 0.8	33.00 .59	54.5 1.2	55.55 .33	9.2 1.3	29.31 .76	58.1 1.1
30.7	46.15 .31	26.1 1.9	49.87 .31	45.0 0.9	33.58 .55	56.0 1.8	55.87 .32	10.8 1.8	30.06 .72	59.5 1.7
May 10.7	46.45 .29	28.2 2.3	50.17 .30	44.1 0.9	34.12 .50	58.1 2.3	56.19 .30	12.8 2.2	30.74 .65	61.5 2.2
20.6	46.73 .26	30.6 2.6	50.46 .28	43.2 0.9	34.60 .44	60.6 2.7	56.48 .28	15.2 2.6	31.35 .56	63.9 2.7
30.6	46.98 .23	33.4 2.8	50.73 .25	42.4 0.8	35.00 .37	63.6 3.1	56.74 .24	18.0 2.9	31.87 .46	66.8 3.0
June 9.6	47.20 .19	36.3 3.0	50.97 .22	41.6 0.7	35.33 .28	66.8 3.3	56.96 .20	20.9 3.1	32.28 .35	70.0 3.2
19.6	47.37 .15	39.4 3.1	51.18 .19	41.0 0.6	35.56 .19	70.3 3.5	57.15 .16	24.0 3.2	32.57 .23	73.4 3.5
29.5	47.50 .10	42.5 3.1	51.35 .15	40.4 0.5	35.71 .09	73.8 3.6	57.28 .11	27.2 3.2	32.73 .10	76.9 3.6
July 9.5	47.58 .06	45.6 3.0	51.49 .11	40.0 0.4	35.75 .01	77.4 3.6	57.37 .06	30.4 3.2	32.76 .03	80.5 3.6
19.5	47.61 .01	48.6 2.9	51.57 .07	39.7 0.2	35.69 .11	81.0 3.5	57.41 .01	33.5 3.0	32.66 .16	84.0 3.5
29.5	47.59 .04	51.4 2.7	51.62 .02	39.5 0.1	35.54 .20	84.4 3.3	57.40 .04	36.4 2.8	32.44 .29	87.5 3.3
Aug. 8.4	47.52 .09	54.0 2.4	51.61 .03	39.4 0.0	35.28 .29	87.5 3.1	57.34 .09	39.1 2.5	32.09 .40	90.7 3.1
18.4	47.41 .13	56.2 2.1	51.56 .07	39.4 0.1	34.95 .37	90.4 2.8	57.22 .13	41.5 2.2	31.63 .51	93.6 2.8
28.4	47.25 .17	58.2 1.8	51.47 .11	39.5 0.1	34.54 .45	93.0 2.4	57.07 .17	43.6 1.9	31.07 .60	96.3 2.4
Sept. 7.3	47.06 .21	59.8 1.4	51.34 .14	39.7 0.2	34.06 .51	95.1 2.0	56.88 .21	45.3 1.5	30.43 .68	98.5 2.0
17.3	46.84 .23	61.0 1.0	51.19 .16	39.8 0.2	33.53 .55	96.8 1.5	56.65 .23	46.6 1.1	29.71 .74	100.3 1.6
27.3	46.60 .24	61.7 0.5	51.02 .18	40.0 0.2	32.95 .58	98.0 1.0	56.41 .25	47.4 0.7	28.94 .79	101.6 1.1
Oct. 7.3	46.36 .24	62.0 0.1	50.84 .18	40.2 0.1	32.36 .60	98.7 0.4	56.16 .25	47.9 0.2	28.14 .81	102.4 0.6
17.2	46.12 .24	61.9 0.4	50.66 .17	40.3 0.1	31.76 .59	98.9 0.1	55.91 .25	47.8 0.3	27.33 .81	102.7 0.0
27.2	45.88 .22	61.3 0.8	50.49 .16	40.4 0.1	31.18 .57	98.5 0.7	55.66 .23	47.3 0.7	26.52 .78	102.4 0.5
Nov. 6.2	45.67 .19	60.2 1.3	50.34 .13	40.5 0.1	30.62 .53	97.5 1.2	55.44 .21	46.4 1.2	25.76 .74	101.6 1.1
16.2	45.49 .16	58.8 1.7	50.22 .10	40.6 0.0	30.11 .48	96.0 1.7	55.25 .17	44.9 1.6	25.05 .67	100.2 1.6
26.1	45.35 .12	56.9 2.1	50.15 .06	40.6 0.0	29.67 .41	94.0 2.2	55.09 .13	43.1 2.0	24.42 .58	98.4 2.1
Dec. 6.1	45.25 .08	54.6 2.4	50.10 .02	40.6 0.0	29.30 .32	91.6 2.6	54.98 .09	40.9 2.4	23.88 .48	96.0 2.6
16.1	45.20 .03	52.1 2.7	50.11 .03	40.7 0.0	29.02 .23	88.7 3.0	54.91 .04	38.3 2.7	23.46 .36	93.2 3.0
26.0	45.20 .02	49.3 2.8	50.16 .07	40.7 0.0	28.84 .13	85.6 3.3	54.90 .01	35.6 2.8	23.16 .23	90.1 3.2
36.0	45.25 .07	46.4 2.9	50.25 .10	40.8 0.0	28.76 .03	82.2 3.5	54.93 .06	32.6 2.9	23.00 .09	86.8 3.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Aquilæ.		β Cygni.		κ Aquilæ.		β Sagittæ.		γ Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 19 20	° ' + 2 54	h m 19 26	° ' +27 44	h m 19 31	° ' − 7 14	h m 19 36	° ' +17 14	h m 19 41	° ' +10 22
	s	"	s	"	s	"	s	"	s	"
Jan. 1.0	27.11 .08	58.1 1.4	40.67 .05	63.4 2.5	30.53 .07	56.7 0.7	33.03 .04	44.2 2.0	30.01 .05	14.4 1.7
11.0	27.20 .11	56.8 1.3	40.74 .09	60.9 2.5	30.62 .11	57.4 0.7	33.10 .08	42.1 2.0	30.08 .09	12.7 1.7
21.0	27.33 .15	55.5 1.3	40.85 .13	58.3 2.5	30.75 .14	58.0 0.6	33.20 .12	40.1 2.0	30.18 .12	11.0 1.6
31.0	27.50 .18	54.3 1.2	40.99 .16	55.9 2.3	30.91 .17	58.6 0.5	33.34 .15	38.2 1.9	30.32 .15	9.4 1.5
Feb. 9.9	27.69 .21	53.2 1.0	41.17 .20	53.7 2.1	31.10 .20	59.1 0.4	33.51 .18	36.4 1.6	30.49 .18	8.0 1.3
19.9	27.90 .23	52.4 0.7	41.39 .23	51.8 1.7	31.31 .23	59.4 0.2	33.71 .21	34.9 1.3	30.69 .21	6.8 1.0
Mar. 1.9	28.14 .25	51.8 0.4	41.63 .26	50.2 1.3	31.55 .25	59.6 0.0	33.94 .24	33.7 1.0	30.91 .23	6.0 0.7
11.9	28.40 .26	51.5 0.1	41.90 .28	49.2 0.8	31.80 .26	59.5 0.2	34.19 .26	32.9 0.6	31.15 .25	5.4 0.4
21.8	28.67 .28	51.5 0.2	42.19 .29	48.6 0.3	32.08 .28	59.2 0.4	34.46 .28	32.6 0.1	31.42 .27	5.2 0.0
31.8	28.96 .29	51.9 0.5	42.49 .31	48.5 0.2	32.36 .29	58.7 0.7	34.74 .29	32.6 0.3	31.69 .28	5.4 0.4
Apr. 10.8	29.24 .29	52.6 0.8	42.80 .31	49.0 0.7	32.65 .30	57.9 0.9	35.04 .30	33.2 0.7	31.98 .29	6.0 0.8
20.7	29.54 .29	53.5 1.1	43.11 .31	50.0 1.2	32.95 .30	56.9 1.1	35.33 .30	34.1 1.1	32.27 .29	7.0 1.1
30.7	29.83 .29	54.8 1.4	43.42 .30	51.4 1.6	33.25 .30	55.8 1.2	35.63 .29	35.5 1.5	32.57 .29	8.3 1.4
May 10.7	30.11 .28	56.2 1.6	43.72 .29	53.2 2.0	33.54 .29	54.5 1.3	35.92 .28	37.2 1.8	32.86 .28	9.9 1.7
20.7	30.38 .26	57.9 1.7	44.00 .27	55.5 2.3	33.82 .27	53.1 1.4	36.20 .27	39.2 2.1	33.14 .27	11.8 1.9
30.6	30.63 .24	59.6 1.8	44.26 .24	58.0 2.6	34.09 .25	51.7 1.4	36.46 .25	41.4 2.3	33.40 .25	13.8 2.1
June 9.6	30.86 .21	61.5 1.8	44.49 .21	60.7 2.8	34.33 .23	50.3 1.4	36.70 .22	43.8 2.4	33.64 .22	15.9 2.2
19.6	31.06 .18	63.3 1.8	44.68 .18	63.5 2.9	34.54 .20	49.0 1.3	36.90 .19	46.2 2.5	33.85 .19	18.1 2.2
29.6	31.22 .14	65.1 1.8	44.84 .14	66.4 2.9	34.72 .16	47.7 1.2	37.07 .15	48.7 2.5	34.02 .16	20.3 2.2
July 9.5	31.34 .10	66.8 1.7	44.95 .09	69.2 2.8	34.86 .12	46.5 1.1	37.20 .11	51.2 2.4	34.16 .12	22.4 2.1
19.5	31.42 .06	68.4 1.5	45.02 .04	72.0 2.7	34.96 .08	45.4 1.0	37.28 .06	53.5 2.3	34.25 .07	24.5 2.0
29.5	31.46 .02	69.8 1.4	45.04 .00	74.6 2.5	35.01 .03	44.6 0.8	37.32 .02	55.7 2.1	34.31 .03	26.4 1.8
Aug. 8.4	31.45 .02	71.1 1.2	45.01 .05	77.0 2.3	35.02 .01	43.8 0.7	37.32 .03	57.7 1.9	34.31 .02	28.0 1.6
18.4	31.41 .06	72.2 1.0	44.94 .09	79.2 2.0	34.99 .05	43.2 0.5	37.27 .07	59.5 1.7	34.28 .06	29.6 1.4
28.4	31.32 .10	73.1 0.8	44.82 .13	81.1 1.7	34.91 .09	42.8 0.3	37.18 .11	61.0 1.4	34.20 .10	30.8 1.1
Sept. 7.4	31.20 .13	73.7 0.6	44.67 .16	82.6 1.4	34.80 .12	42.5 0.2	37.06 .14	62.3 1.1	34.09 .13	31.8 0.9
17.3	31.06 .15	74.2 0.4	44.49 .19	83.8 1.0	34.66 .15	42.3 0.1	36.90 .16	63.3 0.8	33.95 .15	32.6 0.6
27.3	30.89 .17	74.5 0.2	44.29 .21	84.6 0.6	34.50 .16	42.3 0.0	36.73 .18	63.9 0.5	33.78 .17	33.1 0.4
Oct. 7.3	30.72 .17	74.5 0.0	44.08 .21	85.1 0.2	34.33 .17	42.3 0.1	36.55 .19	64.2 0.2	33.61 .18	33.3 0.1
17.3	30.54 .17	74.4 0.2	43.87 .21	85.1 0.2	34.16 .17	42.5 0.2	36.36 .19	64.2 0.2	33.43 .18	33.3 0.2
27.2	30.38 .15	74.1 0.4	43.66 .20	84.7 0.6	34.00 .16	42.8 0.3	36.18 .18	63.9 0.5	33.26 .17	33.0 0.4
Nov. 6.2	30.23 .13	73.5 0.6	43.47 .18	83.9 1.0	33.85 .14	43.1 0.4	36.01 .16	63.3 0.8	33.10 .15	32.5 0.7
16.2	30.11 .11	72.8 0.8	43.31 .15	82.8 1.4	33.73 .11	43.5 0.5	35.86 .13	62.4 1.1	32.96 .12	31.6 0.9
26.1	30.02 .07	72.0 1.0	43.18 .11	81.2 1.7	33.64 .07	44.0 0.6	35.75 .10	61.1 1.4	32.86 .09	30.6 1.2
Dec. 6.1	29.97 .03	70.9 1.1	43.08 .07	79.3 2.0	33.58 .03	44.6 0.6	35.67 .06	59.6 1.6	32.78 .06	29.3 1.4
16.1	29.96 .01	69.7 1.2	43.03 .03	77.2 2.3	33.56 .00	45.3 0.7	35.63 .02	57.9 1.8	32.74 .02	27.9 1.5
26.1	29.98 .05	68.4 1.3	43.02 .01	74.8 2.4	33.59 .04	46.0 0.7	35.62 .02	56.0 2.0	32.75 .02	26.3 1.6
36.0	30.05 .09	67.1 1.4	43.06 .05	72.3 2.5	33.65 .08	46.7 0.7	35.66 .06	53.9 2.0	32.79 .06	24.6 1.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Cygni.		α Aquilæ. (*Altair.*)		ε Draconis.		ε Pavonis.		β Aquilæ.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 19 41	° ′ +44 52	h m 19 45	° ′ + 8 36	h m 19 48	° ′ +70 0	h m 19 48	° ′ −73 10	h m 19 50	° ′ + 6 9
	s	″	s	″	s	″	s	″	s	″
Jan. 1.1	49.87 .01	79.3 3.0	53.97 .05	19.1 1.6	27.20 .17	57.8 3.2	59.49 .05	28.1 3.0	23.81 .04	29.1 1.4
11.0	49.89 .05	76.3 3.1	54.03 .08	17.5 1.6	27.08 .06	54.5 3.3	59.60 .18	25.0 3.1	23.88 .08	27.7 1.4
21.0	49.97 .10	73.2 3.0	54.13 .12	16.0 1.5	27.08 .06	51.2 3.4	59.85 .31	22.0 3.1	23.98 .12	26.2 1.4
31.0	50.09 .15	70.2 2.9	54.27 .15	14.5 1.4	27.20 .18	47.8 3.3	60.23 .43	18.9 3.0	24.11 .15	24.9 1.3
Feb. 9.9	50.27 .20	67.4 2.7	54.43 .18	13.2 1.2	27.44 .29	44.6 3.1	60.72 .54	16.0 2.8	24.27 .18	23.7 1.1
19.9	50.49 .24	64.9 2.4	54.63 .21	12.1 0.9	27.78 .40	41.6 2.7	61.32 .64	13.2 2.6	24.46 .21	22.7 0.9
Mar. 1.9	50.76 .28	62.8 1.9	54.85 .23	11.3 0.6	28.23 .49	39.1 2.3	62.00 .73	10.7 2.4	24.68 .23	22.0 0.6
11.9	51.05 .31	61.2 1.3	55.09 .25	10.8 0.3	28.76 .56	37.0 1.8	62.76 .80	8.4 2.1	24.91 .25	21.6 0.2
21.8	51.38 .34	60.1 0.7	55.35 .27	10.7 0.1	29.36 .62	35.5 1.2	63.59 .85	6.5 1.7	25.17 .27	21.5 0.1
31.8	51.73 .36	59.7 0.1	55.63 .28	11.0 0.4	30.00 .66	34.7 0.5	64.46 .88	5.0 1.3	25.44 .28	21.8 0.5
Apr. 10.8	52.09 .37	59.8 0.5	55.92 .29	11.6 0.8	30.68 .68	34.4 0.1	65.36 .91	3.8 0.9	25.73 .29	22.4 0.8
20.8	52.46 .37	60.6 1.0	56.21 .29	12.6 1.1	31.36 .68	34.9 0.8	66.27 .91	3.1 0.5	26.02 .29	23.4 1.1
30.7	52.83 .36	61.9 1.6	56.51 .29	13.9 1.4	32.03 .66	36.0 1.4	67.18 .90	2.8 0.1	26.32 .29	24.7 1.4
May 10.7	53.18 .34	63.8 2.1	56.80 .28	15.4 1.7	32.66 .61	37.6 1.9	68.07 .87	2.8 0.3	26.61 .29	26.2 1.6
20.7	53.51 .32	66.1 2.5	57.08 .27	17.3 1.9	33.25 .55	39.8 2.4	68.92 .83	3.4 0.7	26.89 .28	28.0 1.8
30.6	53.82 .29	68.8 2.8	57.34 .25	19.2 2.0	33.77 .48	42.4 2.8	69.72 .76	4.3 1.1	27.16 .26	29.8 1.9
June 9.6	54.08 .25	71.8 3.1	57.59 .23	21.3 2.1	34.21 .39	45.4 3.2	70.44 .68	5.6 1.5	27.40 .23	31.8 2.0
19.6	54.31 .20	75.0 3.3	57.80 .20	23.5 2.1	34.55 .29	48.8 3.4	71.07 .58	7.3 1.8	27.62 .20	33.8 2.0
29.6	54.48 .15	78.4 3.4	57.98 .16	25.6 2.1	34.79 .19	52.3 3.6	71.59 .46	9.2 2.1	27.81 .17	35.8 2.0
July 9.5	54.61 .09	81.8 3.4	58.13 .12	27.7 2.0	34.93 .08	55.9 3.6	71.99 .33	11.5 2.3	27.96 .13	37.8 1.9
19.5	54.67 .04	85.1 3.3	58.23 .08	29.6 1.9	34.95 .03	59.5 3.6	72.25 .20	13.9 2.5	28.06 .09	39.6 1.8
29.5	54.68 .02	88.3 3.1	58.28 .04	31.5 1.7	34.86 .14	63.1 3.5	72.38 .06	16.4 2.5	28.12 .04	41.3 1.6
Aug. 8.5	54.63 .08	91.4 2.9	58.30 .01	33.1 1.5	34.67 .24	66.5 3.3	72.37 .09	18.9 2.5	28.14 .00	42.8 1.4
18.4	54.53 .13	94.2 2.6	58.27 .05	34.5 1.3	34.37 .34	69.8 3.1	72.21 .23	21.4 2.4	28.12 .04	44.1 1.2
28.4	54.38 .17	96.7 2.3	58.20 .09	35.7 1.0	33.98 .43	72.7 2.8	71.92 .35	23.7 2.2	28.05 .08	45.2 1.0
Sept. 7.4	54.18 .21	98.8 1.9	58.09 .12	36.7 0.8	33.51 .51	75.3 2.4	71.51 .46	25.8 1.9	27.95 .12	46.0 0.8
17.3	53.95 .24	100.5 1.5	57.96 .15	37.4 0.6	32.96 .57	77.5 2.0	71.00 .55	27.5 1.5	27.82 .15	46.6 0.5
27.3	53.69 .27	101.8 1.1	57.80 .17	37.9 0.4	32.36 .62	79.2 1.5	70.40 .62	28.8 1.1	27.66 .16	47.0 0.3
Oct. 7.3	53.41 .28	102.7 0.6	57.63 .17	38.2 0.1	31.72 .65	80.5 1.0	69.75 .66	29.7 0.6	27.49 .17	47.2 0.1
17.3	53.12 .28	103.0 0.1	57.45 .17	38.1 0.2	31.06 .66	81.2 0.5	69.08 .68	30.0 0.1	27.32 .17	47.2 0.2
27.2	52.84 .27	102.9 0.4	57.28 .16	37.8 0.4	30.40 .65	81.4 0.1	68.40 .66	29.8 0.5	27.15 .16	46.9 0.4
Nov. 6.2	52.58 .25	102.2 0.9	57.12 .15	37.4 0.6	29.76 .63	81.0 0.7	67.76 .61	29.1 1.0	27.00 .14	46.4 0.6
16.2	52.34 .22	101.0 1.4	56.99 .12	36.6 0.9	29.14 .58	80.0 1.2	67.18 .53	27.8 1.5	26.86 .12	45.7 0.8
26.2	52.13 .18	99.4 1.8	56.88 .09	35.6 1.1	28.59 .52	78.6 1.8	66.70 .43	26.1 2.0	26.75 .09	44.7 1.0
Dec. 6.1	51.97 .14	97.3 2.2	56.81 .06	34.5 1.3	28.10 .44	76.5 2.3	66.32 .31	23.9 2.4	26.68 .06	43.6 1.2
16.1	51.85 .09	94.9 2.6	56.77 .02	33.1 1.4	27.70 .35	74.1 2.7	66.06 .18	21.4 2.7	26.64 .02	42.4 1.3
26.1	51.78 .04	92.1 2.9	56.77 .02	31.6 1.5	27.40 .25	71.2 3.0	65.95 .05	18.6 2.9	26.64 .02	41.0 1.4
36.0	51.76 .01	89.2 3.0	56.81 .06	30.1 1.6	27.21 .14	68.0 3.3	65.97 .09	15.6 3.0	26.68 .05	39.6 1.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Sagittæ.		*c* Sagittarii.		τ Aquilæ.		θ Aquilæ.		31 Cygni.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	19 54	+19 13	19 56	−27 59	19 59	+ 6 59	20 6	− 1 6	20 10	+46 26
	s	″	s	″	s	″	s	″	s	″
Jan. 1.1	18.18 .02	19.5 2.1	30.41 .06	15.6 0.6	15.06 .03	49.6 1.4	8.55 .03	61.5 1.0	27.92 .04	26.8 2.9
11.0	18.22 .06	17.4 2.1	30.49 .10	15.0 0.7	15.11 .07	48.1 1.4	8.60 .07	62.5 1.0	27.90 .01	23.8 3.0
21.0	18.31 .10	15.3 2.0	30.60 .14	14.3 0.7	15.20 .11	46.7 1.4	8.69 .10	63.4 0.9	27.94 .06	20.8 3.0
31.0	18.43 .14	13.3 1.9	30.76 .17	13.5 0.8	15.32 .14	45.3 1.3	8.81 .14	64.3 0.8	28.02 .11	17.8 3.0
Feb. 10.0	18.59 .17	11.5 1.7	30.95 .20	12.7 0.9	15.48 .17	44.1 1.1	8.97 .17	65.0 0.7	28.16 .16	14.9 2.8
19.9	18.77 .20	9.9 1.4	31.17 .23	11.8 0.9	15.66 .20	43.1 0.9	9.15 .19	65.6 0.5	28.35 .21	12.2 2.5
Mar. 1.9	18.99 .23	8.6 1.1	31.41 .26	10.9 1.0	15.87 .22	42.4 0.6	9.35 .22	66.0 0.2	28.59 .26	9.9 2.1
11.9	19.23 .25	7.7 0.7	31.68 .28	9.9 1.0	16.10 .24	41.9 0.3	9.58 .24	66.0 0.0	28.87 .30	8.1 1.6
21.8	19.49 .27	7.2 0.3	31.98 .30	8.8 1.1	16.35 .26	41.8 0.1	9.83 .26	65.8 0.3	29.18 .33	6.8 1.0
31.8	19.77 .29	7.2 0.2	32.28 .32	7.8 1.1	16.62 .28	42.1 0.5	10.10 .28	65.4 0.6	29.52 .35	6.0 0.4
Apr. 10.8	20.06 .30	7.6 0.7	32.61 .33	6.7 1.1	16.90 .29	42.8 0.8	10.38 .29	64.6 0.9	29.89 .37	5.9 0.2
20.8	20.36 .30	8.5 1.1	32.94 .34	5.6 1.1	17.20 .30	43.7 1.1	10.67 .30	63.6 1.2	30.26 .38	6.4 0.8
30.7	20.66 .30	9.8 1.5	33.28 .34	4.5 1.0	17.49 .30	45.0 1.4	10.97 .30	62.3 1.4	30.64 .38	7.4 1.3
May 10.7	20.96 .29	11.5 1.8	33.61 .33	3.6 0.9	17.79 .29	46.6 1.7	11.27 .29	60.8 1.5	31.02 .37	9.0 1.8
20.7	21.25 .28	13.5 2.1	33.94 .32	2.7 0.8	18.07 .28	48.4 1.9	11.56 .28	59.2 1.7	31.38 .35	11.2 2.3
30.7	21.52 .26	15.8 2.3	34.25 .30	1.9 0.7	18.34 .26	50.3 2.0	11.83 .27	57.5 1.7	31.71 .32	13.7 2.7
June 9.6	21.77 .23	18.2 2.5	34.54 .28	1.3 0.5	18.60 .24	52.3 2.1	12.09 .25	55.8 1.8	32.01 .28	16.6 3.0
19.6	21.99 .20	20.7 2.6	34.80 .25	0.9 0.3	18.82 .21	54.4 2.1	12.33 .22	54.0 1.7	32.27 .24	19.7 3.2
29.6	22.17 .16	23.3 2.6	35.03 .21	0.6 0.2	19.01 .17	56.5 2.0	12.53 .18	52.3 1.7	32.48 .19	23.0 3.4
July 9.5	22.32 .12	25.9 2.5	35.21 .16	0.6 0.0	19.17 .13	58.5 1.9	12.70 .14	50.7 1.6	32.64 .13	26.4 3.4
19.5	22.42 .08	28.3 2.4	35.35 .11	0.7 0.2	19.28 .09	60.4 1.8	12.82 .10	49.2 1.4	32.75 .08	29.9 3.4
29.5	22.48 .04	30.7 2.3	35.44 .06	0.9 0.3	19.35 .05	62.1 1.7	12.90 .06	47.9 1.3	32.79 .02	33.2 3.3
Aug. 8.5	22.49 .01	32.9 2.1	35.48 .01	1.3 0.5	19.38 .00	63.7 1.5	12.94 .02	46.7 1.1	32.78 .04	36.4 3.1
18.4	22.45 .05	34.8 1.8	35.46 .04	1.8 0.6	19.36 .04	65.1 1.3	12.93 .03	45.8 0.9	32.71 .10	39.4 2.9
28.4	22.38 .09	36.5 1.6	35.41 .08	2.4 0.6	19.30 .08	66.3 1.1	12.88 .07	45.0 0.7	32.58 .15	42.2 2.6
Sept. 7.4	22.26 .13	37.9 1.3	35.31 .12	3.0 0.6	19.20 .11	67.2 0.8	12.80 .10	44.4 0.5	32.41 .19	44.6 2.3
17.4	22.12 .16	39.0 1.0	35.17 .15	3.6 0.6	19.08 .14	67.9 0.6	12.68 .13	44.0 0.3	32.20 .23	46.7 1.9
27.3	21.95 .18	39.8 0.7	35.00 .17	4.2 0.5	18.93 .16	68.4 0.3	12.54 .15	43.8 0.1	31.95 .26	48.3 1.4
Oct. 7.3	21.77 .19	40.3 0.3	34.82 .19	4.7 0.4	18.76 .17	68.6 0.1	12.38 .16	43.7 0.0	31.68 .28	49.5 0.9
17.3	21.58 .19	40.4 0.0	34.63 .19	5.0 0.3	18.59 .17	68.6 0.1	12.21 .17	43.8 0.2	31.40 .28	50.2 0.4
27.2	21.39 .18	40.2 0.4	34.44 .18	5.3 0.2	18.42 .16	68.3 0.4	12.05 .16	44.1 0.3	31.11 .28	50.4 0.1
Nov. 6.2	21.22 .16	39.7 0.7	34.27 .16	5.4 0.0	18.26 .15	67.9 0.6	11.89 .15	44.5 0.5	30.83 .27	50.1 0.6
16.2	21.07 .14	38.8 1.0	34.12 .13	5.4 0.1	18.12 .13	67.2 0.8	11.76 .12	45.0 0.6	30.57 .25	49.3 1.1
26.2	20.94 .11	37.7 1.3	34.00 .10	5.2 0.2	18.01 .10	66.3 1.0	11.65 .09	45.7 0.7	30.34 .22	48.0 1.6
Dec. 6.1	20.85 .08	36.2 1.6	33.92 .06	4.9 0.3	17.93 .06	65.2 1.2	11.57 .06	46.5 0.8	30.15 .18	46.2 2.0
16.1	20.79 .04	34.5 1.8	33.88 .02	4.5 0.4	17.88 .03	64.0 1.3	11.52 .03	47.4 0.9	29.99 .13	44.0 2.4
26.1	20.77 .00	32.6 2.0	33.89 .02	4.0 0.5	17.88 .01	62.6 1.4	11.51 .01	48.3 1.0	29.89 .08	41.4 2.7
36.1	20.79 .04	30.5 2.1	33.93 .06	3.4 0.6	17.90 .04	61.2 1.4	11.54 .04	49.3 1.0	29.83 .03	38.6 2.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	κ Cephei (pr.)		α² Capricorni.		α Pavonis.		γ Cygni.		π Capricorni.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m	° ′	h m	° ′	h m	° ′	h m	° ′	h m	° ′
	20 12	+77 24	20 12	−12 50	20 17	−57 2	20 18	+39 56	20 21	−18 32
	s	″	s	″	s	″	s	″	s	″
Jan. 1.1	9.68 .44	50.3 3.0	30.28 .04	74.6 0.3	43.55 .01	82.0 2.3	37.57 .04	21.3 2.7	35.77 .03	20.7 0.0
11.0	9.34 .26	47.2 3.2	30.34 .07	74.9 0.2	43.60 .08	79.7 2.4	37.56 .01	18.6 2.8	35.81 .07	20.6 0.1
21.0	9.17 .07	43.9 3.3	30.43 .11	75.1 0.2	43.71 .15	77.2 2.5	37.59 .06	15.7 2.8	35.90 .10	20.4 0.2
31.0	9.20 .13	40.6 3.3	30.55 .14	75.2 0.1	43.89 .21	74.8 2.5	37.67 .11	12.9 2.8	36.01 .13	20.2 0.3
Feb. 10.0	9.42 .31	37.3 3.2	30.70 .17	75.3 0.0	44.13 .27	72.3 2.5	37.80 .15	10.2 2.6	36.16 .16	19.8 0.4
19.9	9.83 .49	34.2 2.9	30.89 .20	75.2 0.2	44.42 .32	69.8 2.4	37.97 .19	7.7 2.3	36.34 .19	19.3 0.5
Mar. 1.9	10.40 .65	31.5 2.6	31.10 .22	74.9 0.4	44.77 .37	67.5 2.3	38.19 .23	5.6 1.9	36.55 .22	18.7 0.7
11.9	11.12 .79	29.1 2.1	31.33 .24	74.4 0.5	45.16 .41	65.3 2.1	38.44 .27	3.9 1.5	36.78 .25	18.0 0.8
21.9	11.97 .90	27.3 1.5	31.58 .26	73.8 0.7	45.58 .44	63.3 1.9	38.72 .30	2.7 1.0	37.04 .27	17.1 0.9
31.8	12.91 .98	26.1 0.9	31.86 .28	73.0 0.9	46.04 .47	61.5 1.7	39.03 .32	2.0 0.4	37.32 .29	16.1 1.1
Apr. 10.8	13.91 1.02	25.5 0.3	32.15 .29	72.0 1.1	46.52 .49	59.9 1.4	39.36 .34	2.0 0.2	37.61 .30	15.0 1.2
20.8	14.94 1.03	25.5 0.4	32.45 .30	70.9 1.2	47.03 .51	58.6 1.1	39.71 .35	2.5 0.8	37.92 .31	13.8 1.3
30.7	15.97 1.01	26.2 1.0	32.75 .31	69.6 1.3	47.54 .51	57.7 0.8	40.06 .35	3.5 1.3	38.23 .32	12.5 1.3
May 10.7	16.96 .96	27.5 1.6	33.06 .31	68.3 1.4	48.05 .51	57.0 0.5	40.41 .34	5.1 1.8	38.55 .32	11.2 1.3
20.7	17.88 .88	29.3 2.1	33.36 .30	66.9 1.4	48.55 .49	56.8 0.1	40.75 .33	7.1 2.2	38.86 .31	9.9 1.3
30.7	18.70 .77	31.6 2.5	33.66 .28	65.5 1.4	49.03 .47	56.8 0.3	41.06 .31	9.6 2.6	39.16 .29	8.6 1.2
June 9.6	19.40 .63	34.4 2.9	33.93 .26	64.2 1.3	49.48 .43	57.2 0.6	41.36 .28	12.3 2.9	39.45 .27	7.5 1.1
19.6	19.97 .49	37.5 3.2	34.18 .24	63.0 1.2	49.88 .38	58.0 0.9	41.61 .24	15.3 3.1	39.71 .25	6.4 1.0
29.6	20.38 .33	40.8 3.4	34.40 .20	61.8 1.1	50.24 .32	59.1 1.2	41.83 .19	18.5 3.2	39.94 .21	5.6 0.8
July 9.6	20.63 .17	44.4 3.6	34.58 .16	60.8 0.9	50.54 .26	60.4 1.5	42.00 .14	21.8 3.3	40.14 .17	4.8 0.6
19.5	20.72 .00	48.0 3.6	34.72 .12	60.0 0.8	50.75 .19	62.0 1.7	42.11 .09	25.1 3.2	40.29 .13	4.3 0.4
29.5	20.63 .17	51.6 3.6	34.81 .07	59.3 0.6	50.90 .11	63.8 1.9	42.18 .04	28.3 3.1	40.40 .08	4.0 0.3
Aug. 8.5	20.38 .33	55.2 3.5	34.86 .03	58.8 0.4	50.97 .03	65.8 2.0	42.19 .02	31.3 3.0	40.46 .04	3.8 0.1
18.4	19.96 .49	58.6 3.3	34.86 .02	58.5 0.2	50.96 .05	67.7 2.0	42.14 .07	34.2 2.8	40.47 .01	3.8 0.1
28.4	19.40 .63	61.8 3.0	34.82 .06	58.3 0.1	50.87 .12	69.7 1.9	42.05 .12	36.8 2.5	40.44 .05	3.9 0.2
Sept. 7.4	18.71 .76	64.6 2.7	34.74 .10	58.3 0.0	50.72 .19	71.5 1.8	41.91 .16	39.1 2.1	40.36 .09	4.1 0.3
17.4	17.89 .86	67.2 2.4	34.63 .13	58.4 0.1	50.49 .25	73.2 1.6	41.74 .19	41.0 1.7	40.25 .13	4.5 0.3
27.3	16.98 .95	69.3 2.0	34.49 .15	58.5 0.2	50.22 .29	74.6 1.3	41.53 .22	42.6 1.3	40.11 .15	4.8 0.4
Oct. 7.3	16.00 1.01	71.0 1.5	34.33 .16	58.8 0.3	49.92 .32	75.7 0.9	41.30 .24	43.7 0.9	39.95 .17	5.2 0.4
17.3	14.96 1.05	72.2 0.9	34.16 .17	59.1 0.3	49.58 .33	76.4 0.5	41.05 .24	44.4 0.5	39.78 .17	5.6 0.4
27.3	13.90 1.06	72.8 0.4	33.99 .16	59.4 0.3	49.25 .33	76.7 0.1	40.81 .24	44.6 0.0	39.61 .17	6.0 0.4
Nov. 6.2	12.84 1.04	72.9 0.2	33.84 .15	59.7 0.3	48.93 .31	76.6 0.4	40.57 .23	44.4 0.5	39.45 .15	6.3 0.3
16.2	11.82 1.00	72.4 0.8	33.70 .13	60.0 0.3	48.64 .27	76.0 0.8	40.35 .21	43.6 1.0	39.31 .12	6.6 0.2
26.2	10.85 .92	71.3 1.3	33.59 .10	60.4 0.4	48.38 .23	75.1 1.2	40.15 .18	42.4 1.5	39.19 .10	6.8 0.2
Dec. 6.1	9.98 .82	69.7 1.8	33.51 .07	60.8 0.4	48.18 .17	73.7 1.5	39.98 .15	40.8 1.9	39.10 .07	7.0 0.1
16.1	9.22 .69	67.6 2.3	33.46 .03	61.1 0.3	48.05 .10	72.1 1.8	39.85 .11	38.7 2.2	39.04 .04	7.1 0.1
26.1	8.60 .54	65.0 2.7	33.45 .01	61.4 0.3	47.98 .04	70.1 2.1	39.76 .07	36.3 2.5	39.02 .00	7.1 0.0
36.1	8.14 .37	62.1 3.0	33.48 .05	61.8 0.3	47.98 .03	67.9 2.3	39.72 .02	33.7 2.7	39.04 .04	7.1 0.0

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Delphini.		Groombridge 3241.		α Delphini.		β Pavonis.		α Cygni.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 20 28	° ′ +10 57	h m 20 30	° ′ +72 11	h m 20 34	° ′ +15 33	h m 20 35	° ′ −66 33	h m 20 38	° ′ +44 55
	s	″	s	″	s	″	s	″	s	″
Jan. 1.1	25.94 .01	53.9 1.6	22.76 .33	48.9 2.9	59.37 .00	40.8 1.8	55.73 .06	48.7 2.7	0.50 .07	34.4 2.7
11.1	25.96 .04	52.4 1.6	22.50 .20	45.9 3.1	59.39 .03	39.0 1.8	55.72 .03	46.0 2.8	0.45 .02	31.7 2.8
21.0	26.02 .07	50.8 1.6	22.36 .07	42.6 3.3	59.43 .06	37.2 1.8	55.79 .12	43.1 2.9	0.45 .03	28.8 2.9
31.0	26.11 .11	49.3 1.5	22.35 .06	39.3 3.3	59.52 .10	35.5 1.7	55.96 .21	40.1 3.0	0.50 .08	25.9 2.9
Feb. 10.0	26.23 .14	47.9 1.3	22.48 .19	36.0 3.2	59.63 .13	33.9 1.5	56.22 .30	37.1 3.0	0.61 .13	23.0 2.8
19.9	26.38 .17	46.7 1.1	22.74 .32	32.9 3.0	59.78 .16	32.5 1.3	56.56 .37	34.2 2.9	0.76 .18	20.3 2.5
Mar. 1.9	26.57 .20	45.8 0.8	23.12 .44	30.0 2.7	59.96 .19	31.3 1.0	56.96 .44	31.4 2.7	0.96 .22	18.0 2.2
11.9	26.78 .22	45.2 0.4	23.61 .54	27.6 2.2	60.16 .22	30.5 0.6	57.44 .50	28.7 2.5	1.20 .26	16.0 1.7
21.9	27.02 .25	45.0 0.0	24.20 .63	25.6 1.7	60.40 .25	30.0 0.2	57.97 .56	26.3 2.3	1.49 .30	14.5 1.2
31.8	27.27 .27	45.1 0.3	24.86 .69	24.2 1.1	60.65 .27	30.0 0.2	58.55 .60	24.2 2.0	1.81 .33	13.6 0.7
Apr. 10.8	27.55 .28	45.6 0.7	25.58 .74	23.4 0.5	60.93 .29	30.4 0.6	59.18 .63	22.3 1.7	2.15 .36	13.2 0.1
20.8	27.84 .29	46.5 1.1	26.33 .76	23.3 0.2	61.22 .30	31.2 1.0	59.82 .66	20.8 1.3	2.52 .37	13.5 0.5
30.8	28.14 .30	47.7 1.4	27.09 .75	23.8 0.8	61.52 .30	32.4 1.4	60.49 .67	19.7 0.9	2.89 .37	14.3 1.1
May 10.7	28.44 .30	49.3 1.7	27.84 .73	24.9 1.4	61.82 .30	33.9 1.7	61.16 .67	19.0 0.5	3.26 .37	15.6 1.6
20.7	28.73 .29	51.1 1.9	28.54 .68	26.6 2.0	62.13 .30	35.8 2.0	61.82 .65	18.7 0.1	3.63 .36	17.5 2.1
30.7	29.02 .28	53.1 2.1	29.19 .61	28.8 2.5	62.42 .28	37.9 2.2	62.46 .62	18.8 0.3	3.98 .34	19.9 2.4
June 9.6	29.29 .26	55.3 2.2	29.77 .53	31.5 2.9	62.69 .26	40.2 2.3	63.06 .58	19.4 0.7	4.30 .31	22.6 2.8
19.6	29.53 .23	57.5 2.3	30.25 .43	34.6 3.2	62.94 .23	42.6 2.4	63.61 .52	20.3 1.1	4.59 .27	25.6 3.1
29.6	29.75 .20	59.8 2.3	30.63 .32	37.9 3.4	63.16 .20	45.0 2.5	64.09 .44	21.6 1.5	4.83 .22	28.8 3.3
July 9.6	29.93 .16	62.0 2.2	30.90 .21	41.4 3.6	63.34 .16	47.4 2.4	64.49 .36	23.3 1.8	5.03 .17	32.1 3.4
19.5	30.06 .12	64.2 2.1	31.05 .09	45.1 3.7	63.49 .12	49.8 2.3	64.80 .26	25.2 2.1	5.17 .11	35.5 3.4
29.5	30.16 .08	66.2 2.0	31.07 .03	48.7 3.7	63.59 .08	52.1 2.2	65.02 .16	27.4 2.2	5.26 .06	38.9 3.3
Aug. 8.5	30.21 .03	68.1 1.8	30.98 .15	52.4 3.6	63.64 .03	54.2 2.0	65.13 .06	29.7 2.3	5.28 .00	42.2 3.2
18.5	30.22 .02	69.8 1.6	30.77 .27	55.9 3.4	63.65 .01	56.1 1.8	65.13 .05	32.0 2.4	5.26 .06	45.3 3.0
28.4	30.18 .06	71.2 1.3	30.44 .38	59.2 3.2	63.62 .06	57.8 1.6	65.03 .15	34.4 2.3	5.17 .11	48.2 2.7
Sept. 7.4	30.10 .10	72.4 1.0	30.02 .47	62.3 2.9	63.54 .09	59.3 1.3	64.83 .25	36.6 2.1	5.04 .16	50.8 2.4
17.4	29.99 .13	73.3 0.8	29.50 .55	65.0 2.5	63.43 .12	60.4 1.0	64.54 .33	38.7 1.9	4.86 .20	53.0 2.1
27.3	29.86 .15	74.0 0.6	28.91 .62	67.3 2.1	63.29 .15	61.3 0.7	64.18 .39	40.4 1.6	4.65 .23	54.9 1.7
Oct. 7.3	29.70 .17	74.4 0.3	28.26 .68	69.2 1.6	63.14 .16	61.9 0.4	63.76 .44	41.8 1.2	4.41 .25	56.3 1.2
17.3	29.53 .17	74.6 0.0	27.56 .71	70.6 1.1	62.97 .17	62.2 0.1	63.30 .47	42.7 0.7	4.15 .26	57.3 0.7
27.3	29.36 .17	74.5 0.2	26.84 .72	71.4 0.6	62.79 .17	62.2 0.2	62.83 .47	43.2 0.2	3.89 .26	57.8 0.2
Nov. 6.2	29.20 .16	74.1 0.5	26.11 .72	71.7 0.0	62.62 .16	61.8 0.5	62.36 .46	43.2 0.3	3.62 .26	57.8 0.3
16.2	29.05 .14	73.5 0.8	25.41 .69	71.4 0.6	62.47 .14	61.2 0.8	61.91 .42	42.6 0.8	3.37 .24	57.3 0.8
26.2	28.93 .12	72.6 1.0	24.74 .64	70.5 1.2	62.34 .12	60.3 1.0	61.52 .37	41.6 1.3	3.14 .22	56.3 1.3
Dec. 6.2	28.83 .09	71.6 1.2	24.12 .58	69.1 1.7	62.23 .09	59.2 1.3	61.18 .30	40.1 1.7	2.94 .19	54.8 1.7
16.1	28.76 .06	70.3 1.4	23.58 .49	67.1 2.2	62.15 .06	57.8 1.5	60.92 .21	38.2 2.1	2.77 .15	52.9 2.1
26.1	28.72 .02	68.9 1.5	23.14 .39	64.7 2.6	62.10 .03	56.2 1.6	60.75 .12	35.9 2.4	2.64 .10	50.6 2.5
36.1	28.72 .02	67.3 1.6	22.80 .27	61.8 3.0	62.09 .01	54.5 1.8	60.68 .03	33.3 2.7	2.56 .05	48.0 2.7

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.		ψ Capricorni.		ε Cygni.		μ Aquarii.		12 Year Cat. 1879.		ν Cygni.	
		Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
		h m 20 40	° ′ −25 37	h m 20 42	° ′ +33 35	h m 20 47	° ′ − 9 21	h m 20 51	° ′ +80 10	h m 20 53	° ′ +40 46
		s	″	s	″	s	″	s	″	s	″
Jan.	1.1	10.47 .01	48.1 0.4	9.40 .04	54.7 2.4	15.60 .00	28.2 0.5	61.03 .76	55.7 2.6	26.06 .08	67.7 2.4
	11.1	10.50 .05	47.6 0.6	9.38 .00	52.3 2.5	15.62 .04	28.6 0.4	60.37 .55	52.9 2.9	26.00 .03	65.1 2.6
	21.1	10.56 .09	47.0 0.7	9.40 .04	49.7 2.5	15.67 .07	29.0 0.3	59.93 .32	49.9 3.2	26.00 .02	62.4 2.7
	31.0	10.67 .12	46.3 0.8	9.46 .08	47.2 2.5	15.76 .10	29.3 0.2	59.73 .08	46.6 3.3	26.04 .06	59.6 2.7
Feb.	10.0	10.80 .15	45.4 0.9	9.56 .12	44.7 2.4	15.87 .13	29.4 0.1	59.77 .17	43.3 3.3	26.12 .11	56.9 2.6
	20.0	10.97 .18	44.5 1.0	9.70 .16	42.5 2.1	16.02 .16	29.4 0.1	60.06 .41	40.1 3.1	26.25 .16	54.4 2.4
Mar.	1.9	11.17 .21	43.4 1.1	9.88 .20	40.5 1.8	16.20 .19	29.2 0.3	60.58 .63	37.1 2.8	26.43 .20	52.1 2.1
	11.9	11.40 .24	42.2 1.2	10.10 .23	39.0 1.4	16.40 .22	28.8 0.5	61.32 .83	34.5 2.5	26.64 .24	50.2 1.7
	21.9	11.65 .27	41.0 1.3	10.35 .26	37.8 0.9	16.62 .24	28.2 0.7	62.24 1.00	32.2 2.0	26.90 .27	48.8 1.2
	31.9	11.93 .29	39.7 1.3	10.63 .29	37.2 0.4	16.87 .26	27.4 0.9	63.32 1.14	30.5 1.4	27.19 .30	47.8 0.7
Apr.	10.8	12.23 .31	38.3 1.4	10.94 .31	37.1 0.2	17.14 .28	26.4 1.1	64.52 1.24	29.4 0.8	27.51 .33	47.4 0.1
	20.8	12.54 .32	36.9 1.4	11.26 .33	37.5 0.7	17.43 .29	25.1 1.3	65.79 1.29	28.8 0.2	27.85 .35	47.6 0.5
	30.8	12.87 .33	35.5 1.4	11.59 .33	38.5 1.2	17.73 .30	23.8 1.4	67.09 1.30	28.9 0.4	28.21 .36	48.4 1.0
May	10.7	13.20 .33	34.2 1.3	11.92 .33	39.9 1.7	18.04 .31	22.2 1.5	68.38 1.27	29.6 1.0	28.57 .36	49.6 1.5
	20.7	13.53 .33	32.9 1.2	12.25 .32	41.8 2.1	18.35 .30	20.7 1.6	69.62 1.20	30.9 1.6	28.92 .35	51.4 2.0
	30.7	13.85 .32	31.8 1.1	12.57 .31	44.1 2.4	18.65 .29	19.1 1.6	70.77 1.09	32.8 2.1	29.27 .35	53.6 2.4
June	9.7	14.16 .30	30.8 0.9	12.87 .28	46.6 2.7	18.93 .28	17.5 1.6	71.80 .95	35.1 2.6	29.59 .31	56.2 2.7
	19.6	14.45 .27	30.0 0.7	13.14 .25	49.5 2.9	19.20 .25	15.9 1.5	72.68 .79	37.9 3.0	29.88 .27	59.1 3.0
	29.6	14.71 .24	29.4 0.5	13.37 .21	52.5 3.0	19.44 .22	14.5 1.4	73.38 .61	41.0 3.3	30.13 .25	62.2 3.2
July	9.6	14.92 .20	29.0 0.3	13.56 .17	55.6 3.1	19.65 .19	13.2 1.2	73.89 .41	44.4 3.5	30.34 .18	65.4 3.3
	19.6	15.10 .16	28.8 0.1	13.71 .12	58.7 3.1	19.81 .15	12.1 1.1	74.20 .21	47.9 3.6	30.50 .13	68.7 3.3
	29.5	15.23 .11	28.8 0.1	13.81 .07	61.7 3.0	19.94 .10	11.1 0.9	74.30 .00	51.6 3.7	30.61 .08	72.0 3.2
Aug.	8.5	15.32 .06	29.0 0.3	13.86 .02	64.6 2.8	20.02 .06	10.4 0.7	74.18 .21	55.2 3.7	30.67 .03	75.2 3.1
	18.5	15.35 .01	29.4 0.5	13.85 .03	67.4 2.6	20.05 .01	9.8 0.5	73.87 .42	58.9 3.6	30.67 .03	78.2 2.9
	28.5	15.33 .04	29.9 0.6	13.80 .07	69.9 2.4	20.04 .03	9.4 0.3	73.35 .61	62.4 3.4	30.61 .08	81.0 2.7
Sept.	7.4	15.27 .08	30.5 0.6	13.71 .11	72.2 2.1	19.99 .07	9.2 0.1	72.65 .79	65.6 3.1	30.51 .12	83.6 2.4
	17.4	15.16 .12	31.2 0.7	13.58 .15	74.1 1.8	19.90 .10	9.2 0.0	71.78 .94	68.6 2.8	30.37 .16	85.8 2.1
	27.4	15.03 .15	31.9 0.7	13.41 .18	75.7 1.4	19.78 .13	9.2 0.1	70.77 1.08	71.3 2.5	30.19 .19	87.7 1.7
Oct.	7.3	14.87 .17	32.6 0.6	13.22 .20	76.8 1.0	19.64 .15	9.4 0.2	69.63 1.19	73.5 2.0	29.98 .22	89.2 1.3
	17.3	14.70 .18	33.2 0.6	13.01 .21	77.6 0.6	19.49 .16	9.7 0.3	68.40 1.27	75.3 1.5	29.76 .23	90.2 0.8
	27.3	14.52 .18	33.7 0.5	12.80 .21	78.0 0.1	19.33 .16	10.1 0.4	67.09 1.32	76.6 1.0	29.52 .24	90.8 0.4
Nov.	6.3	14.34 .17	34.1 0.3	12.59 .20	77.8 0.3	19.18 .15	10.5 0.4	65.76 1.33	77.4 0.5	29.28 .23	90.9 0.1
	16.2	14.18 .15	34.3 0.2	12.40 .19	77.3 0.8	19.03 .13	10.9 0.5	64.43 1.32	77.5 0.1	29.05 .22	90.6 0.6
	26.2	14.05 .12	34.4 0.0	12.22 .17	76.4 1.2	18.91 .11	11.4 0.5	63.13 1.26	77.1 0.7	28.84 .20	89.7 1.1
Dec.	6.2	13.94 .09	34.4 0.1	12.06 .14	75.0 1.6	18.81 .08	11.9 0.5	61.91 1.17	76.1 1.3	28.66 .17	88.4 1.5
	16.1	13.87 .06	34.2 0.2	11.94 .11	73.3 1.9	18.74 .05	12.4 0.5	60.80 1.04	74.5 1.8	28.50 .14	86.6 1.9
	26.1	13.83 .02	33.9 0.4	11.86 .07	71.2 2.2	18.70 .02	12.9 0.5	59.83 .88	72.4 2.3	28.38 .10	84.5 2.3
	36.1	13.83 .02	33.5 0.5	11.80 .03	68.9 2.4	18.70 .01	13.4 0.5	59.04 .68	69.9 2.7	28.30 .06	82.1 2.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	61¹ Cygni.		ζ Cygni.		τ Cygni.		α Cephei.		ι Pegasi.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 21 2	° ′ +38 15	h m 21 8	° ′ +29 48	h m 21 10	° ′ +37 37	h m 21 16	° ′ +62 9	h m 21 17	° ′ +19 22
	s	″	s	″	s	″	s	″	s	″
Jan. 1.1	24.31 .06	39.7 2.3	40.50 .06	71.2 2.1	47.50 .08	19.4 2.3	10.06 .23	59.9 2.4	27.60 .04	45.2 1.7
11.1	24.27 .02	37.4 2.4	40.46 .02	69.0 2.2	47.44 .04	17.0 2.4	9.86 .17	57.2 2.8	27.57 .01	43.4 1.8
21.1	24.27 .02	34.9 2.5	40.46 .02	66.7 2.3	47.42 .00	14.5 2.6	9.73 .10	54.3 3.1	27.57 .02	41.6 1.8
31.0	24.31 .06	32.3 2.6	40.49 .05	64.4 2.3	47.44 .04	11.9 2.6	9.67 .02	51.1 3.2	27.61 .05	39.8 1.8
Feb. 10.0	24.39 .11	29.8 2.5	40.56 .09	62.1 2.2	47.51 .09	9.3 2.5	9.70 .07	47.9 3.2	27.68 .09	38.1 1.7
20.0	24.52 .15	27.4 2.3	40.68 .13	60.0 2.0	47.62 .13	6.9 2.3	9.81 .15	44.8 3.0	27.78 .12	36.5 1.5
Mar. 2.0	24.69 .19	25.3 1.9	40.83 .17	58.2 1.7	47.77 .17	4.7 2.0	10.00 .23	41.9 2.8	27.92 .16	35.1 1.2
11.9	24.90 .23	23.5 1.5	41.01 .20	56.6 1.3	47.96 .21	2.9 1.6	10.27 .31	39.2 2.4	28.09 .19	34.1 0.9
21.9	25.16 .27	22.2 1.1	41.24 .24	55.5 0.9	48.20 .25	1.5 1.2	10.61 .37	37.0 2.0	28.30 .22	33.4 0.5
31.9	25.44 .30	21.4 0.6	41.49 .27	54.9 0.4	48.47 .28	0.5 0.7	11.02 .43	35.3 1.4	28.53 .25	33.1 0.1
Apr. 10.8	25.76 .33	21.1 0.0	41.77 .29	54.7 0.1	48.77 .31	0.1 0.2	11.47 .48	34.2 0.8	28.79 .27	33.2 0.4
20.8	26.10 .35	21.3 0.5	42.07 .31	55.0 0.6	49.09 .33	0.2 0.4	11.97 .51	33.7 0.2	29.07 .29	33.8 0.8
30.8	26.45 .36	22.1 1.1	42.39 .32	55.8 1.1	49.43 .35	0.9 0.9	12.49 .53	33.8 0.4	29.37 .31	34.8 1.2
May 10.8	26.81 .36	23.4 1.6	42.72 .33	57.1 1.5	49.78 .35	2.1 1.4	13.02 .53	34.5 1.0	29.68 .31	36.1 1.6
20.7	27.17 .35	25.2 2.0	43.05 .33	58.8 1.9	50.13 .35	3.8 1.9	13.55 .52	35.8 1.6	29.99 .31	37.8 1.9
30.7	27.52 .34	27.5 2.4	43.37 .31	60.9 2.2	50.48 .34	5.9 2.3	14.06 .49	37.7 2.1	30.30 .31	39.9 2.2
June 9.7	27.85 .32	30.1 2.7	43.67 .29	63.3 2.5	50.80 .31	8.3 2.6	14.53 .45	40.0 2.6	30.60 .29	42.1 2.4
19.7	28.15 .29	33.0 3.0	43.96 .27	66.0 2.7	51.10 .28	11.1 2.9	14.96 .40	42.8 3.0	30.88 .27	44.6 2.5
29.6	28.42 .25	36.1 3.2	44.21 .24	68.8 2.9	51.36 .25	14.1 3.1	15.33 .34	45.9 3.3	31.13 .24	47.1 2.6
July 9.6	28.65 .20	39.3 3.3	44.43 .20	71.8 2.9	51.59 .20	17.2 3.2	15.63 .27	49.3 3.5	31.35 .20	49.7 2.6
19.6	28.83 .15	42.6 3.3	44.60 .15	74.7 2.9	51.77 .15	20.4 3.2	15.87 .19	52.9 3.6	31.53 .16	52.3 2.6
29.5	28.96 .10	45.9 3.3	44.73 .11	77.6 2.9	51.90 .10	23.6 3.2	16.02 .11	56.5 3.7	31.67 .12	54.8 2.5
Aug. 8.5	29.03 .05	49.2 3.2	44.81 .06	80.5 2.8	51.98 .05	26.8 3.1	16.09 .03	60.2 3.7	31.77 .07	57.2 2.3
18.5	29.06 .00	52.2 3.0	44.84 .01	83.1 2.6	52.01 .00	29.8 2.9	16.08 .05	63.8 3.6	31.82 .03	59.4 2.1
28.5	29.03 .05	55.1 2.7	44.82 .04	85.6 2.4	51.98 .05	32.6 2.7	15.99 .13	67.3 3.4	31.82 .02	61.4 1.9
Sept. 7.4	28.96 .10	57.7 2.4	44.76 .08	87.8 2.1	51.91 .09	35.1 2.4	15.83 .20	70.6 3.1	31.78 .06	63.2 1.7
17.4	28.84 .14	60.0 2.1	44.66 .12	89.7 1.8	51.80 .13	37.4 2.1	15.60 .26	73.6 2.9	31.71 .10	64.6 1.4
27.4	28.69 .17	62.0 1.8	44.53 .15	91.3 1.4	51.64 .17	39.3 1.7	15.31 .32	76.3 2.4	31.60 .13	65.8 1.1
Oct. 7.4	28.51 .19	63.5 1.4	44.37 .17	92.6 1.1	51.46 .19	40.8 1.3	14.96 .36	78.5 2.0	31.46 .15	66.8 0.8
17.3	28.31 .21	64.7 0.9	44.19 .19	93.4 0.7	51.26 .21	42.0 0.9	14.58 .39	80.3 1.6	31.31 .16	67.4 0.4
27.3	28.10 .21	65.4 0.5	44.00 .19	93.9 0.3	51.05 .22	42.6 0.5	14.18 .41	81.6 1.1	31.15 .17	67.6 0.1
Nov. 6.3	27.88 .21	65.6 0.0	43.81 .19	94.0 0.1	50.83 .21	42.9 0.0	13.76 .42	82.4 0.5	30.98 .16	67.6 0.2
16.2	27.68 .20	65.4 0.5	43.62 .18	93.6 0.5	50.62 .20	42.7 0.5	13.33 .42	82.6 0.1	30.82 .16	67.2 0.6
26.2	27.49 .18	64.7 0.9	43.45 .16	92.9 0.9	50.42 .19	42.0 0.9	12.92 .40	82.3 0.7	30.67 .14	66.5 0.9
Dec. 6.2	27.32 .16	63.6 1.3	43.30 .14	91.8 1.3	50.24 .17	40.9 1.3	12.54 .37	81.4 1.2	30.54 .12	65.5 1.1
16.2	27.18 .13	62.1 1.7	43.18 .11	90.3 1.6	50.09 .14	39.3 1.7	12.19 .33	79.9 1.7	30.44 .09	64.3 1.4
26.1	27.07 .09	60.1 2.1	43.08 .08	88.5 1.9	49.97 .10	37.4 2.1	11.88 .28	77.9 2.2	30.36 .06	62.8 1.6
36.1	27.00 .05	57.9 2.4	43.01 .05	86.4 2.1	49.88 .06	35.2 2.4	11.64 .21	75.4 2.6	30.30 .03	61.1 1.8

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Capricorni.		β Aquarii.		β Cephei (*pr.*).		ξ Aquarii.		74 Cygni.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*
	h m 21 20	° ′ −22 50	h m 21 26	° ′ − 6 0	h m 21 27	° ′ +70 7	h m 21 32	° ′ − 8 17	h m 21 32	° ′ +39 57
	s	″	s	″	s	″	s	″	s	″
Jan. 1.1	57.59 .02	39.9 0.2	17.79 .03	36.4 0.6	19.94 .39	37.2 2.3	25.85 .03	66.5 0.5	56.09 .10	65.7 2.1
11.1	57.58 .01	39.6 0.4	17.77 .00	37.0 0.5	19.59 .30	34.6 2.7	25.83 .01	66.9 0.4	56.00 .07	63.5 2.4
21.1	57.60 .03	39.1 0.6	17.79 .03	37.5 0.4	19.34 .20	31.8 3.0	25.84 .02	67.3 0.3	55.95 .03	61.0 2.5
31.0	57.65 .07	38.5 0.7	17.83 .06	37.9 0.3	19.20 .09	28.6 3.2	25.88 .05	67.5 0.2	55.94 .01	58.4 2.6
Feb. 10.0	57.74 .10	37.7 0.8	17.90 .09	38.2 0.2	19.17 .03	25.4 3.2	25.95 .08	67.6 0.0	55.98 .06	55.8 2.6
20.0	57.86 .14	36.8 1.0	18.01 .12	38.3 0.0	19.26 .15	22.2 3.2	26.05 .11	67.6 0.1	56.06 .10	53.2 2.4
Mar. 2.0	58.01 .17	35.7 1.1	18.14 .15	38.2 0.2	19.46 .26	19.1 2.9	26.18 .15	67.4 0.3	56.19 .15	50.9 2.2
11.9	58.20 .20	34.5 1.3	18.31 .18	37.9 0.4	19.78 .37	16.3 2.6	26.34 .18	66.9 0.6	56.36 .20	48.9 1.8
21.9	58.41 .23	33.2 1.4	18.50 .21	37.3 0.7	20.20 .47	13.8 2.2	26.53 .20	66.2 0.8	56.58 .24	47.3 1.4
31.9	58.65 .25	31.7 1.5	18.72 .23	36.6 0.9	20.71 .55	11.9 1.7	26.74 .23	65.4 1.0	56.83 .28	46.1 0.9
Apr. 10.9	58.92 .28	30.2 1.6	18.97 .26	35.5 1.1	21.30 .61	10.5 1.1	26.99 .26	64.2 1.2	57.13 .31	45.5 0.4
20.8	59.21 .30	28.5 1.6	19.24 .28	34.3 1.3	21.94 .66	9.7 0.5	27.26 .28	62.9 1.4	57.45 .33	45.3 0.2
30.8	59.52 .32	26.9 1.6	19.53 .29	32.8 1.5	22.63 .69	9.5 0.1	27.54 .29	61.4 1.6	57.79 .35	45.8 0.7
May 10.8	59.84 .33	25.2 1.6	19.83 .30	31.2 1.7	23.32 .70	9.9 0.7	27.85 .31	59.8 1.7	58.15 .36	46.7 1.2
20.7	60.17 .33	23.7 1.5	20.14 .31	29.5 1.8	24.02 .68	10.9 1.3	28.16 .31	58.1 1.8	58.51 .36	48.2 1.7
30.7	60.50 .32	22.2 1.4	20.44 .30	27.7 1.8	24.69 .65	12.5 1.9	28.46 .31	56.3 1.8	58.87 .35	50.1 2.1
June 9.7	60.82 .31	20.8 1.3	20.74 .29	25.9 1.8	25.32 .60	14.7 2.4	28.77 .30	54.5 1.7	59.22 .33	52.4 2.5
19.7	61.12 .29	19.6 1.1	21.03 .27	24.2 1.7	25.88 .53	17.2 2.8	29.06 .28	52.8 1.7	59.54 .31	55.0 2.8
29.6	61.40 .26	18.7 0.9	21.29 .25	22.5 1.6	26.38 .45	20.2 3.1	29.32 .25	51.2 1.6	59.83 .27	58.0 3.0
July 9.6	61.65 .23	17.9 0.6	21.52 .22	20.9 1.5	26.78 .35	23.5 3.4	29.56 .22	49.7 1.4	60.08 .23	61.0 3.2
19.6	61.86 .19	17.4 0.4	21.72 .18	19.5 1.3	27.08 .25	27.0 3.6	29.77 .19	48.4 1.2	60.29 .18	64.3 3.2
29.6	62.02 .14	17.2 0.2	21.88 .14	18.2 1.1	27.29 .15	30.7 3.7	29.93 .14	47.3 1.0	60.44 .13	67.5 3.2
Aug. 8.5	62.14 .10	17.1 0.1	21.99 .09	17.2 0.9	27.38 .04	34.4 3.7	30.05 .10	46.4 0.8	60.55 .08	70.7 3.2
18.5	62.22 .05	17.3 0.3	22.06 .05	16.4 0.7	27.37 .06	38.2 3.7	30.13 .05	45.7 0.6	60.60 .03	73.8 3.0
28.5	62.24 .00	17.7 0.4	22.09 .00	15.8 0.5	27.26 .17	41.8 3.5	30.16 .01	45.2 0.4	60.61 .02	76.8 2.8
Sept. 7.4	62.22 .04	18.2 0.6	22.07 .04	15.4 0.3	27.04 .26	45.3 3.3	30.15 .03	44.9 0.2	60.56 .07	79.5 2.6
17.4	62.15 .08	18.8 0.7	22.02 .07	15.2 0.1	26.73 .35	48.5 3.1	30.10 .07	44.8 0.0	60.46 .11	82.0 2.3
27.4	62.05 .12	19.6 0.7	21.92 .10	15.1 0.0	26.33 .43	51.4 2.7	30.02 .10	44.9 0.1	60.33 .15	84.1 2.0
Oct. 7.4	61.92 .14	20.3 0.7	21.81 .13	15.2 0.2	25.87 .49	54.0 2.3	29.90 .12	45.1 0.3	60.16 .18	85.9 1.6
17.3	61.77 .16	21.0 0.7	21.67 .14	15.5 0.3	25.34 .54	56.1 1.9	29.77 .14	45.4 0.4	59.97 .20	87.2 1.2
27.3	61.61 .16	21.7 0.6	21.53 .15	15.8 0.4	24.78 .58	57.7 1.4	29.63 .15	45.8 0.5	59.76 .21	88.2 0.7
Nov. 6.3	61.44 .16	22.3 0.5	21.38 .15	16.2 0.5	24.18 .60	58.8 0.8	29.48 .15	46.3 0.5	59.54 .22	88.7 0.3
16.3	61.28 .15	22.9 0.4	21.24 .14	16.7 0.5	23.57 .60	59.3 0.2	29.34 .14	46.8 0.6	59.32 .21	88.7 0.2
26.2	61.14 .13	23.2 0.3	21.11 .12	17.3 0.6	22.97 .59	59.2 0.4	29.21 .12	47.4 0.6	59.11 .20	88.3 0.7
Dec. 6.2	61.02 .11	23.4 0.1	20.99 .10	17.9 0.6	22.40 .56	58.6 1.0	29.09 .10	47.9 0.5	58.92 .18	87.4 1.1
16.2	60.92 .08	23.4 0.0	20.90 .08	18.5 0.6	21.86 .51	57.3 1.5	29.00 .08	48.5 0.5	58.75 .16	86.0 1.6
26.1	60.85 .05	23.3 0.2	20.84 .05	19.1 0.6	21.38 .44	55.5 2.0	28.93 .05	49.0 0.5	58.60 .13	84.2 1.9
36.1	60.82 .02	23.1 0.4	20.80 .02	19.7 0.6	20.98 .35	53.2 2.5	28.89 .03	49.5 0.5	58.49 .10	82.1 2.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ¹ Octantis.		ε Pegasi.		11 Cephei.		π² Cygni.		μ Capricorni.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 21 35	° ′ −83 10	h m 21 39	° ′ + 9 24	h m 21 40	° ′ +70 50	h m 21 43	° +48 50	h m 21 47	° ′ −14 0
	s	″	s	″	s	″	s	″	s	″
Jan. 1.1	30.71 .91	50.8 2.9	16.54 .05	66.9 1.2	25.20 .43	83.4 2.1	5.37 .15	65.4 2.2	50.84 .05	79.6 0.2
11.1	29.94 .62	47.7 3.2	16.51 .02	65.6 1.3	24.81 .34	81.0 2.6	5.23 .11	63.1 2.5	50.81 .02	79.7 0.1
21.1	29.46 .32	44.4 3.5	16.50 .01	64.4 1.3	24.51 .24	78.2 2.9	5.14 .07	60.5 2.7	50.80 .01	79.7 0.0
31.1	29.30 .00	40.8 3.6	16.52 .04	63.1 1.2	24.33 .13	75.2 3.1	5.10 .02	57.7 2.8	50.83 .04	79.6 0.2
Feb. 10.0	29.44 .29	37.1 3.7	16.58 .07	62.0 1.1	24.26 .00	72.0 3.2	5.11 .04	54.8 2.8	50.88 .07	79.3 0.3
20.0	29.88 .58	33.4 3.7	16.66 .10	60.9 0.9	24.31 .12	68.7 3.2	5.18 .09	52.0 2.7	50.97 .10	78.9 0.5
Mar. 2.0	30.60 .86	29.8 3.6	16.78 .13	60.1 0.7	24.49 .23	65.6 3.0	5.30 .15	49.4 2.5	51.09 .13	78.3 0.7
11.9	31.59 1.11	26.3 3.4	16.93 .16	59.6 0.4	24.78 .35	62.7 2.7	5.47 .20	47.0 2.2	51.24 .16	77.5 0.9
21.9	32.82 1.34	23.0 3.1	17.11 .20	59.4 0.1	25.18 .45	60.2 2.3	5.70 .25	45.0 1.8	51.42 .20	76.5 1.1
31.9	34.26 1.54	20.1 2.8	17.32 .22	59.4 0.2	25.69 .54	58.1 1.8	5.98 .30	43.4 1.3	51.63 .22	75.3 1.3
Apr. 10.9	35.89 1.71	17.4 2.4	17.56 .25	59.9 0.6	26.27 .62	56.5 1.3	6.30 .34	42.4 0.7	51.87 .25	73.9 1.4
20.8	37.66 1.83	15.2 2.0	17.82 .27	60.7 1.0	26.92 .67	55.6 0.7	6.66 .37	41.9 0.2	52.13 .27	72.4 1.6
30.8	39.55 1.92	13.4 1.6	18.11 .29	61.8 1.3	27.62 .71	55.2 0.1	7.04 .39	42.0 0.4	52.42 .29	70.8 1.7
May 10.8	41.50 1.98	12.1 1.1	18.40 .30	63.2 1.6	28.34 .72	55.4 0.6	7.44 .40	42.7 1.0	52.72 .31	69.1 1.7
20.7	43.48 1.98	11.3 0.6	18.71 .31	64.9 1.8	29.07 .71	56.3 1.1	7.85 .41	43.9 1.5	53.03 .32	67.3 1.8
30.7	45.45 1.95	11.0 0.0	19.02 .30	66.9 2.0	29.77 .68	57.7 1.7	8.25 .40	45.7 2.0	53.35 .31	65.5 1.7
June 9.7	47.36 1.86	11.2 0.5	19.32 .29	69.0 2.1	30.44 .64	59.7 2.2	8.64 .38	47.9 2.4	53.66 .31	63.8 1.7
19.7	49.16 1.73	11.9 1.0	19.60 .28	71.2 2.2	31.04 .57	62.2 2.7	9.01 .35	50.5 2.7	53.96 .29	62.2 1.5
29.6	50.81 1.55	13.2 1.5	19.87 .25	73.4 2.2	31.58 .49	65.0 3.0	9.33 .31	53.4 3.0	54.24 .27	60.8 1.4
July 9.6	52.26 1.33	14.9 1.9	20.10 .22	75.6 2.2	32.03 .40	68.3 3.3	9.62 .26	56.6 3.3	54.50 .24	59.5 1.2
19.6	53.46 1.07	16.9 2.2	20.31 .18	77.8 2.1	32.38 .30	71.7 3.5	9.85 .21	59.9 3.4	54.72 .20	58.4 1.0
29.6	54.39 .78	19.3 2.6	20.47 .14	79.8 2.0	32.63 .19	75.4 3.7	10.03 .15	63.4 3.4	54.90 .16	57.6 0.7
Aug. 8.5	55.02 .46	22.0 2.8	20.59 .10	81.8 1.8	32.76 .08	79.1 3.7	10.15 .09	66.8 3.4	55.04 .12	56.9 0.5
18.5	55.32 .13	24.9 2.9	20.66 .05	83.5 1.6	32.79 .03	82.8 3.7	10.22 .03	70.2 3.3	55.14 .07	56.5 0.3
28.5	55.28 .21	27.8 2.9	20.70 .01	85.0 1.4	32.71 .13	86.5 3.6	10.22 .03	73.5 3.2	55.19 .03	56.4 0.1
Sept. 7.5	54.90 .54	30.7 2.8	20.68 .03	86.3 1.2	32.52 .24	90.1 3.4	10.16 .08	76.6 3.0	55.19 .02	56.4 0.1
17.4	54.20 .86	33.4 2.6	20.64 .07	87.4 0.9	32.24 .33	93.4 3.2	10.06 .13	79.4 2.7	55.16 .05	56.6 0.3
27.4	53.19 1.15	35.9 2.3	20.55 .10	88.2 0.7	31.86 .41	96.5 2.9	9.90 .17	81.9 2.3	55.08 .09	57.0 0.4
Oct. 7.4	51.92 1.39	38.0 1.9	20.44 .12	88.7 0.4	31.41 .48	99.2 2.5	9.71 .22	84.1 2.0	54.98 .11	57.5 0.5
17.3	50.44 1.57	39.7 1.4	20.31 .14	89.0 0.2	30.90 .54	101.4 2.0	9.49 .23	85.8 1.5	54.85 .13	58.0 0.6
27.3	48.80 1.69	40.9 0.9	20.17 .14	89.1 0.0	30.33 .58	103.2 1.5	9.24 .25	87.1 1.0	54.71 .14	58.6 0.6
Nov. 6.3	47.07 1.75	41.4 0.3	20.02 .15	88.9 0.3	29.73 .61	104.5 1.0	8.98 .26	87.9 0.5	54.57 .15	59.2 0.6
16.3	45.31 1.74	41.4 0.4	19.88 .14	88.6 0.5	29.11 .62	105.3 0.4	8.72 .26	88.2 0.0	54.42 .14	59.8 0.6
26.2	43.60 1.67	40.7 1.0	19.74 .13	88.0 0.7	28.49 .61	105.4 0.2	8.46 .25	88.0 0.5	54.29 .13	60.4 0.5
Dec. 6.2	42.00 1.52	39.4 1.6	19.62 .11	87.2 0.9	27.88 .59	104.9 0.8	8.21 .24	87.2 1.0	54.17 .11	60.9 0.5
16.2	40.57 1.33	37.6 2.1	19.52 .09	86.2 1.0	27.32 .54	103.9 1.3	7.98 .21	86.0 1.5	54.06 .09	61.3 0.4
26.2	39.35 1.09	35.2 2.6	19.44 .07	85.1 1.2	26.80 .48	102.2 1.9	7.79 .18	84.3 1.9	53.98 .07	61.6 0.3
36.1	38.40 .81	32.4 3.0	19.38 .05	83.9 1.4	26.36 .41	100.1 2.4	7.63 .14	82.1 2.3	53.93 .04	61.9 0.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	16 Pegasi.		79 Draconis.		α Aquarii.		α Gruis.		π^2 Pegasi.	
	Right Ascension.	Declination North.	Right Ascension.	Declination North.	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination North.
	h m 21 48	° ′ +25 27	h m 21 51	° ′ +73 13	h m 22 0	° ′ − 0 47	h m 22 1	° ′ −47 26	h m 22 5	° ′ +32 41
	s	″	s	″	s	″	s	″	s	″
Jan. 1.1	30.69 .08	28.7 1.7	34.47 .53	66.1 2.1	39.10 .05	75.1 0.8	55.84 .11	48.9 1.3	32.75 .11	29.2 1.8
11.1	30.63 .05	26.9 1.9	33.99 .43	63.8 2.5	39.06 .03	75.9 0.7	55.75 .07	47.4 1.6	32.65 .08	27.4 2.0
21.1	30.60 .02	24.9 2.0	33.61 .32	61.2 2.8	39.04 .01	76.6 0.7	55.70 .03	45.6 1.9	32.59 .05	25.3 2.1
31.1	30.60 .02	23.0 2.0	33.35 .19	58.2 3.1	39.05 .02	77.2 0.6	55.70 .02	43.6 2.1	32.56 .01	23.1 2.2
Feb. 10.0	30.63 .05	21.0 1.9	33.23 .06	55.0 3.2	39.08 .05	77.8 0.5	55.73 .06	41.4 2.3	32.57 .03	20.8 2.2
20.0	30.70 .09	19.1 1.8	33.24 .08	51.8 3.2	39.15 .08	78.2 0.3	55.82 .11	39.0 2.5	32.62 .07	18.6 2.1
Mar. 2.0	30.80 .12	17.4 1.5	33.39 .22	48.6 3.1	39.25 .11	78.3 0.1	55.95 .15	36.4 2.6	32.70 .11	16.6 1.9
12.0	30.95 .16	16.0 1.2	33.68 .36	45.6 2.8	39.38 .15	78.3 0.2	56.13 .20	33.8 2.6	32.83 .15	14.8 1.6
21.9	31.13 .20	15.0 0.9	34.10 .48	43.0 2.4	39.54 .18	78.0 0.4	56.35 .24	31.2 2.6	33.00 .19	13.4 1.2
31.9	31.34 .23	14.3 0.4	34.64 .59	40.7 2.0	39.74 .21	77.4 0.7	56.61 .28	28.6 2.6	33.22 .23	12.3 0.8
Apr. 10.9	31.59 .26	14.1 0.0	35.28 .68	39.0 1.4	39.96 .24	76.6 1.0	56.91 .32	26.1 2.5	33.46 .26	11.7 0.4
20.8	31.87 .29	14.3 0.5	36.00 .74	37.9 0.9	40.21 .26	75.4 1.2	57.25 .35	23.7 2.3	33.74 .29	11.6 0.1
30.8	32.17 .31	15.0 0.9	36.77 .79	37.3 0.3	40.48 .28	74.1 1.5	57.62 .38	21.5 2.1	34.05 .32	12.0 0.6
May 10.8	32.48 .32	16.1 1.3	37.57 .81	37.3 0.4	40.77 .30	72.5 1.7	58.01 .40	19.6 1.8	34.38 .33	12.8 1.1
20.7	32.80 .32	17.6 1.7	38.39 .81	38.0 1.0	41.08 .31	70.7 1.8	58.42 .41	17.8 1.5	34.72 .34	14.1 1.5
30.7	33.13 .32	19.5 2.0	39.18 .78	39.3 1.5	41.38 .31	68.8 1.9	58.84 .42	16.5 1.2	35.06 .34	15.9 1.9
June 9.7	33.45 .31	21.7 2.3	39.94 .73	41.1 2.1	41.69 .30	66.9 2.0	59.26 .41	15.4 0.9	35.40 .33	18.0 2.3
19.7	33.75 .29	24.2 2.5	40.64 .66	43.4 2.5	41.99 .29	64.9 2.0	59.66 .39	14.8 0.5	35.72 .31	20.4 2.5
29.6	34.03 .26	26.8 2.7	41.26 .57	46.1 2.9	42.26 .27	63.0 1.9	60.04 .37	14.5 0.1	36.03 .29	23.0 2.7
July 9.6	34.28 .23	29.5 2.8	41.79 .47	49.2 3.2	42.52 .24	61.1 1.8	60.40 .33	14.6 0.3	36.30 .25	25.9 2.9
19.6	34.49 .19	32.3 2.8	42.21 .36	52.6 3.5	42.74 .20	59.4 1.7	60.70 .28	15.1 0.7	36.53 .21	28.8 3.0
29.6	34.66 .15	35.0 2.7	42.51 .24	56.2 3.6	42.92 .16	57.8 1.5	60.96 .23	16.0 1.0	36.72 .17	31.8 3.0
Aug. 8.5	34.79 .10	37.7 2.6	42.70 .12	59.9 3.7	43.06 .12	56.4 1.3	61.16 .17	17.2 1.3	36.87 .12	34.7 2.9
18.5	34.86 .06	40.3 2.5	42.76 .00	63.7 3.8	43.16 .08	55.2 1.1	61.30 .11	18.6 1.6	36.97 .07	37.6 2.8
28.5	34.90 .01	42.6 2.3	42.69 .12	67.4 3.7	43.22 .04	54.3 0.9	61.37 .04	20.3 1.8	37.01 .02	40.3 2.6
Sept. 7.5	34.89 .03	44.8 2.0	42.51 .24	71.0 3.5	43.24 .01	53.5 0.6	61.38 .02	22.2 1.9	37.02 .02	42.9 2.4
17.4	34.84 .07	46.7 1.7	42.22 .35	74.5 3.3	43.21 .04	53.0 0.4	61.33 .08	24.1 1.9	36.98 .06	45.2 2.1
27.4	34.75 .10	48.3 1.4	41.82 .44	77.6 3.0	43.15 .08	52.7 0.2	61.23 .13	26.0 1.8	36.89 .10	47.2 1.8
Oct. 7.4	34.63 .13	49.6 1.1	41.33 .53	80.5 2.7	43.06 .10	52.6 0.0	61.07 .17	27.8 1.7	36.78 .13	48.9 1.5
17.4	34.48 .15	50.5 0.8	40.77 .60	83.0 2.2	42.95 .12	52.6 0.1	60.88 .21	29.4 1.5	36.64 .15	50.2 1.2
27.3	34.33 .16	51.2 0.4	40.14 .65	85.0 1.7	42.82 .13	52.9 0.3	60.66 .23	30.8 1.2	36.48 .17	51.2 0.8
Nov. 6.3	34.16 .17	51.4 0.1	39.46 .69	86.4 1.2	42.68 .14	53.2 0.4	60.43 .24	31.9 0.9	36.30 .18	51.8 0.4
16.3	34.00 .16	51.3 0.3	38.76 .71	87.4 0.6	42.55 .14	53.7 0.5	60.18 .24	32.6 0.5	36.12 .18	51.9 0.0
26.2	33.84 .15	50.8 0.6	38.04 .71	87.7 0.0	42.41 .13	54.3 0.6	59.95 .22	32.9 0.1	35.95 .17	51.7 0.4
Dec. 6.2	33.69 .14	50.0 1.0	37.34 .68	87.5 0.6	42.30 .11	55.0 0.7	59.74 .20	32.9 0.3	35.78 .16	51.0 0.8
16.2	33.56 .12	48.9 1.3	36.68 .64	86.6 1.2	42.19 .09	55.7 0.8	59.55 .17	32.4 0.7	35.62 .15	50.0 1.2
26.2	33.45 .10	47.5 1.6	36.06 .58	85.1 1.7	42.10 .07	56.4 0.8	59.39 .14	31.6 1.0	35.49 .12	48.6 1.6
36.1	33.36 .07	45.8 1.9	35.52 .50	83.2 2.2	42.04 .05	57.2 0.8	59.27 .10	30.3 1.4	35.37 .09	46.9 1.9

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Aquarii.		υ Octantis.		γ Aquarii.		π Aquarii.		σ Aquarii.	
	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 22 11	° ′ − 8 16	h m 22 12	° ′ −86 27	h m 22 16	° ′ − 1 53	h m 22 20	° ′ + 0 52	h m 22 25	° ′ −11 10
	s	″	s	″	s	″	s	″	s	″
Jan. 1.2	33.70 .06	49.1 0.5	24.04 2.38	102.9 2.7	29.78 .06	23.2 0.7	10.50 .07	17.5 0.9	21.69 .07	80.4 0.4
11.1	33.65 .04	49.6 0.4	21.91 1.88	100.1 3.1	29.72 .04	23.9 0.7	10.44 .05	16.7 0.8	21.63 .05	80.7 0.3
21.1	33.63 .01	49.9 0.3	20.30 1.33	96.8 3.4	29.69 .02	24.6 0.6	10.41 .02	15.9 0.7	21.59 .03	80.9 0.1
31.1	33.63 .02	50.1 0.1	19.25 .76	93.3 3.6	29.68 .01	25.1 0.5	10.40 .00	15.2 0.6	21.58 .00	80.9 0.0
Feb. 10.0	33.66 .04	50.2 0.0	18.78 .18	89.6 3.8	29.71 .04	25.6 0.3	10.41 .03	14.6 0.5	21.60 .03	80.8 0.2
20.0	33.72 .07	50.0 0.2	18.90 .40	85.7 3.8	29.76 .07	25.8 0.2	10.46 .06	14.1 0.4	21.64 .06	80.5 0.4
Mar. 2.0	33.81 .11	49.8 0.4	19.58 .96	81.9 3.8	29.84 .10	25.9 0.0	10.54 .09	13.9 0.2	21.72 .09	80.0 0.6
12.0	33.93 .14	49.2 0.6	20.80 1.48	78.2 3.7	29.96 .13	25.8 0.3	10.65 .13	13.8 0.1	21.82 .12	79.3 0.8
21.9	34.08 .17	48.5 0.9	22.52 1.96	74.6 3.5	30.10 .16	25.4 0.5	10.79 .16	14.1 0.4	21.96 .16	78.4 1.0
31.9	34.27 .20	47.5 1.1	24.70 2.39	71.2 3.2	30.28 .20	24.8 0.8	10.97 .19	14.6 0.6	22.14 .19	77.3 1.2
Apr. 10.9	34.48 .23	46.4 1.3	27.29 2.77	68.2 2.8	30.50 .23	23.9 1.0	11.18 .22	15.3 0.9	22.35 .22	75.9 1.4
20.9	34.73 .26	45.0 1.5	30.23 3.09	65.6 2.5	30.74 .25	22.7 1.3	11.41 .25	16.4 1.2	22.58 .25	74.4 1.6
30.8	35.00 .28	43.4 1.6	33.45 3.34	63.3 2.0	31.00 .28	21.3 1.5	11.68 .27	17.7 1.4	22.85 .28	72.7 1.7
May 10.8	35.29 .30	41.7 1.8	36.89 3.52	61.5 1.5	31.29 .29	19.7 1.7	11.96 .29	19.2 1.6	23.13 .30	70.9 1.8
20.8	35.59 .31	39.8 1.8	40.47 3.62	60.2 1.0	31.59 .30	18.0 1.8	12.26 .30	21.0 1.8	23.44 .31	69.0 1.9
30.7	35.90 .31	38.0 1.9	44.10 3.63	59.5 0.5	31.90 .31	16.1 1.9	12.57 .31	22.9 1.9	23.75 .31	67.1 1.9
June 9.7	36.22 .31	36.1 1.9	47.71 3.57	59.3 0.0	32.21 .30	14.1 2.0	12.88 .30	24.9 2.0	24.06 .31	65.2 1.8
19.7	36.52 .29	34.3 1.8	51.20 3.40	59.6 0.6	32.51 .29	12.1 2.1	13.18 .29	26.9 2.0	24.37 .30	63.4 1.7
29.7	36.81 .28	32.5 1.7	54.49 3.15	60.4 1.1	32.79 .27	10.2 1.9	13.47 .27	28.9 2.0	24.67 .28	61.8 1.6
July 9.6	37.07 .25	30.9 1.5	57.47 2.81	61.8 1.6	33.06 .25	8.4 1.8	13.73 .25	30.8 1.9	24.94 .26	60.2 1.4
19.6	37.30 .22	29.5 1.3	60.07 2.38	63.6 2.0	33.29 .22	6.6 1.6	13.96 .22	32.7 1.8	25.19 .23	58.9 1.2
29.6	37.50 .18	28.3 1.1	62.21 1.88	65.8 2.4	33.49 .18	5.1 1.5	14.16 .18	34.4 1.6	25.40 .19	57.8 1.0
Aug. 8.6	37.66 .14	27.3 0.9	63.82 1.32	68.4 2.7	33.65 .14	3.7 1.3	14.32 .14	35.9 1.4	25.57 .15	56.9 0.7
18.5	37.77 .09	26.5 0.7	64.84 .71	71.2 2.9	33.76 .09	2.6 1.0	14.44 .10	37.2 1.2	25.70 .11	56.3 0.5
28.5	37.84 .05	26.0 0.4	65.23 .06	74.2 3.0	33.83 .05	1.6 0.8	14.52 .05	38.3 1.0	25.78 .06	55.9 0.3
Sept. 7.5	37.87 .01	25.7 0.2	64.97 .59	77.2 3.0	33.86 .01	1.0 0.6	14.55 .01	39.1 0.7	25.82 .02	55.8 0.0
17.4	37.85 .03	25.6 0.0	64.06 1.23	80.1 2.9	33.85 .03	0.5 0.4	14.54 .02	39.7 0.5	25.82 .02	55.9 0.2
27.4	37.80 .07	25.7 0.2	62.53 1.83	82.9 2.6	33.81 .06	0.2 0.2	14.50 .05	40.2 0.3	25.78 .05	56.1 0.4
Oct. 7.4	37.72 .09	25.9 0.3	60.43 2.37	85.4 2.3	33.73 .09	0.2 0.0	14.43 .09	40.4 0.1	25.71 .08	56.5 0.5
17.4	37.62 .11	26.3 0.4	57.83 2.82	87.4 1.8	33.63 .11	0.3 0.2	14.33 .11	40.4 0.1	25.61 .11	57.1 0.6
27.3	37.49 .13	26.8 0.5	54.82 3.17	89.0 1.3	33.51 .12	0.6 0.3	14.21 .12	40.2 0.2	25.49 .12	57.7 0.6
Nov. 6.3	37.36 .13	27.4 0.6	51.53 3.40	90.1 0.7	33.38 .13	1.0 0.4	14.08 .13	39.9 0.4	25.36 .13	58.3 0.7
16.3	37.22 .13	27.9 0.6	48.07 3.50	90.5 0.1	33.25 .13	1.4 0.5	13.95 .13	39.4 0.5	25.23 .13	59.0 0.7
26.3	37.09 .13	28.6 0.6	44.58 3.47	90.3 0.5	33.12 .13	2.0 0.6	13.82 .13	38.9 0.6	25.10 .13	59.7 0.6
Dec. 6.2	36.97 .11	29.2 0.6	41.18 3.31	89.4 1.2	33.00 .12	2.7 0.7	13.70 .12	38.2 0.7	24.97 .12	60.3 0.6
16.2	36.86 .10	29.8 0.6	38.00 3.03	87.9 1.8	32.89 .10	3.4 0.7	13.59 .10	37.5 0.8	24.86 .11	60.8 0.5
26.2	36.77 .08	30.3 0.5	35.14 2.66	85.9 2.3	32.80 .08	4.1 0.7	13.50 .08	36.7 0.8	24.76 .09	61.3 0.4
36.1	36.70 .05	30.8 0.4	32.71 2.20	83.3 2.8	32.73 .05	4.8 0.7	13.42 .06	35.9 0.8	24.68 .06	61.7 0.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*a* Lacertæ.		*η* Aquarii.		226 Cephei (B.).		10 Lacertæ.		*β* Octantis.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 22 27	° ′ +49 46	h m 22 30	° ′ − 0 37	h m 22 30	° ′ +75 42	h m 22 34	° ′ +38 31	h m 22 35	° ′ −81 53
	s	″	s	″	s	″	s	″	s	″
Jan. 1.2	10.12 .20	25.1 1.8	13.43 .07	53.0 0.7	29.03 .70	63.4 1.5	46.55 .15	63.9 1.6	46.77 1.10	91.1 2.3
11.1	9.94 .16	23.2 2.1	13.37 .05	53.7 0.7	28.37 .61	61.6 2.0	46.42 .12	62.1 1.9	45.76 .91	88.6 2.7
21.1	9.80 .12	20.9 2.4	13.33 .03	54.4 0.6	27.81 .50	59.3 2.5	46.32 .09	60.1 2.1	44.96 .69	85.7 3.1
31.1	9.70 .08	18.3 2.6	13.31 .00	55.1 0.6	27.37 .37	56.7 2.8	46.24 .05	57.8 2.3	44.38 .46	82.4 3.4
Feb. 10.1	9.65 .03	15.6 2.7	13.32 .02	55.6 0.4	27.07 .22	53.7 3.1	46.21 .01	55.5 2.4	44.04 .22	78.8 3.6
20.0	9.65 .03	12.9 2.7	13.35 .05	55.9 0.3	26.93 .06	50.5 3.2	46.22 .03	53.1 2.3	43.94 .03	75.1 3.7
Mar. 2.0	9.71 .09	10.2 2.6	13.42 .08	56.1 0.1	26.95 .10	47.3 3.2	46.27 .07	50.9 2.2	44.09 .26	71.4 3.8
12.0	9.82 .15	7.6 2.4	13.52 .12	56.0 0.2	27.14 .27	44.2 3.0	46.37 .12	48.8 1.9	44.47 .50	67.6 3.7
21.9	10.00 .20	5.4 2.0	13.66 .15	55.7 0.4	27.49 .42	41.3 2.7	46.52 .17	47.0 1.6	45.07 .72	63.9 3.6
31.9	10.23 .26	3.6 1.6	13.82 .19	55.1 0.7	27.99 .57	38.7 2.4	46.71 .21	45.6 1.2	45.89 .92	60.4 3.4
Apr. 10.9	10.51 .31	2.2 1.1	14.02 .22	54.3 1.0	28.62 .69	36.6 1.9	46.94 .26	44.6 0.8	46.91 1.10	57.1 3.1
20.9	10.84 .35	1.3 0.6	14.26 .25	53.2 1.2	29.37 .80	34.9 1.4	47.22 .29	44.0 0.3	48.09 1.27	54.2 2.8
30.8	11.21 .38	0.9 0.1	14.52 .27	51.8 1.5	30.21 .87	33.8 0.8	47.53 .32	44.0 0.2	49.43 1.40	51.6 2.4
May 10.8	11.60 .40	1.1 0.5	14.80 .29	50.2 1.7	31.12 .92	33.4 0.2	47.87 .35	44.4 0.7	50.89 1.51	49.4 1.9
20.8	12.02 .42	1.9 1.0	15.09 .30	48.5 1.8	32.06 .94	33.4 0.4	48.22 .36	45.4 1.2	52.44 1.58	47.7 1.4
30.8	12.44 .42	3.2 1.5	15.40 .31	46.6 1.9	33.00 .93	34.2 1.0	48.59 .37	46.8 1.6	54.04 1.61	46.6 0.9
June 9.7	12.86 .41	5.0 2.0	15.71 .31	44.6 2.0	33.92 .90	35.4 1.6	48.96 .36	48.6 2.0	55.65 1.62	45.9 0.4
19.7	13.26 .39	7.2 2.4	16.02 .30	42.6 2.0	34.80 .84	37.2 2.1	49.31 .34	50.9 2.4	57.25 1.57	45.8 0.2
29.7	13.63 .36	9.8 2.7	16.31 .28	40.6 2.0	35.61 .76	39.6 2.5	49.64 .32	53.4 2.6	58.78 1.48	46.3 0.7
July 9.6	13.97 .32	12.6 3.0	16.58 .26	38.7 1.9	36.33 .66	42.3 2.9	49.95 .29	56.2 2.9	60.21 1.36	47.2 1.2
19.6	14.26 .27	15.8 3.2	16.82 .23	36.9 1.7	36.93 .55	45.4 3.2	50.22 .25	59.1 3.0	61.48 1.19	48.7 1.7
29.6	14.51 .22	19.1 3.4	17.03 .19	35.3 1.5	37.42 .42	48.8 3.5	50.45 .21	62.2 3.1	62.57 .99	50.6 2.1
Aug. 8.6	14.70 .16	22.5 3.4	17.20 .15	33.8 1.3	37.78 .29	52.4 3.6	50.64 .16	65.3 3.1	63.44 .75	52.9 2.5
18.5	14.83 .10	25.9 3.4	17.33 .11	32.6 1.1	38.00 .15	56.1 3.8	50.77 .11	68.4 3.0	64.06 .49	55.5 2.7
28.5	14.91 .04	29.3 3.3	17.41 .06	31.6 0.9	38.09 .01	59.9 3.8	50.85 .06	71.3 2.9	64.41 .20	58.4 2.9
Sept. 7.5	14.92 .01	32.5 3.1	17.46 .02	30.8 0.7	38.04 .12	63.6 3.7	50.89 .01	74.2 2.7	64.47 .08	61.3 3.0
17.5	14.88 .07	35.6 2.9	17.46 .02	30.3 0.4	37.85 .25	67.3 3.6	50.88 .03	76.8 2.5	64.24 .37	64.3 2.9
27.4	14.79 .11	38.4 2.7	17.42 .05	30.0 0.2	37.53 .38	70.8 3.4	50.82 .07	79.2 2.3	63.74 .64	67.2 2.8
Oct. 7.4	14.65 .16	40.9 2.3	17.36 .08	29.8 0.0	37.10 .49	74.0 3.1	50.73 .11	81.3 1.9	62.97 .89	69.8 2.5
17.4	14.48 .19	43.0 1.9	17.27 .10	29.9 0.2	36.56 .59	76.9 2.7	50.60 .14	83.0 1.6	61.97 1.10	72.2 2.1
27.3	14.27 .22	44.8 1.5	17.16 .12	30.1 0.3	35.92 .67	79.4 2.3	50.45 .16	84.4 1.2	60.78 1.27	74.1 1.6
Nov. 6.3	14.04 .24	46.1 1.1	17.04 .13	30.5 0.4	35.21 .74	81.5 1.8	50.28 .18	85.4 0.8	59.44 1.40	75.5 1.1
16.3	13.80 .25	46.9 0.6	16.91 .13	31.0 0.5	34.44 .79	83.0 1.2	50.10 .19	86.0 0.3	58.00 1.47	76.3 0.5
26.3	13.55 .25	47.2 0.0	16.78 .13	31.6 0.6	33.64 .81	84.0 0.6	49.91 .19	86.1 0.1	56.52 1.48	76.5 0.1
Dec. 6.2	13.30 .25	47.0 0.5	16.66 .12	32.2 0.7	32.82 .82	84.3 0.0	49.72 .18	85.8 0.5	55.06 1.44	76.1 0.7
16.2	13.05 .23	46.2 1.0	16.55 .10	32.9 0.7	32.01 .79	84.1 0.6	49.54 .17	85.0 1.0	53.66 1.35	75.0 1.3
26.2	12.83 .21	45.0 1.5	16.45 .09	33.7 0.7	31.23 .75	83.2 1.2	49.38 .16	83.8 1.4	52.38 1.21	73.4 1.9
36.2	12.63 .18	43.3 1.9	16.37 .07	34.4 0.7	30.52 .70	81.7 1.8	49.23 .14	82.3 1.8	51.26 1.03	71.2 2.5

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Pegasi.		λ Pegasi.		ι Cephei.		λ Aquarii.		α Piscis Australis. (*Fomalhaut.*)	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension	Declination *South.*
	h m 22 36	° ′ +10 18	h m 22 41	° ′ +23 2	h m 22 46	° ′ +65 40	h m 22 47	° ′ − 8 6	h m 22 52	° ′ −30 8
	s	″	s	″	s	″	s	″	s	″
Jan. 1.2	28.83 .08	42.2 1.0	43.15 .10	34.5 1.3	6.63 .40	50.8 1.4	24.31 .08	39.1 0.4	7.93 .10	71.4 0.3
11.1	28.76 .06	41.1 1.1	43.06 .08	33.1 1.5	6.26 .34	49.1 1.9	24.24 .06	39.5 0.4	7.83 .08	71.0 0.6
21.1	28.71 .04	40.0 1.2	42.99 .06	31.5 1.6	5.95 .28	46.9 2.4	24.18 .04	39.8 0.3	7.76 .06	70.3 0.8
31.1	28.68 .02	38.8 1.1	42.94 .03	29.8 1.7	5.70 .21	44.3 2.7	24.15 .02	40.0 0.1	7.72 .03	69.3 1.1
Feb. 10.1	28.67 .01	37.7 1.0	42.92 .00	28.1 1.7	5.52 .13	41.5 2.9	24.14 .01	40.1 0.0	7.70 .00	68.1 1.3
20.0	28.70 .04	36.7 0.9	42.93 .03	26.4 1.6	5.43 .04	38.4 3.0	24.16 .04	40.0 0.2	7.72 .03	66.7 1.5
Mar. 2.0	28.76 .08	35.9 0.7	42.98 .07	24.9 1.4	5.44 .05	35.4 3.0	24.22 .07	39.6 0.4	7.76 .07	65.0 1.8
12.0	28.85 .11	35.3 0.5	43.07 .11	23.6 1.2	5.54 .15	32.4 2.9	24.30 .10	39.1 0.6	7.85 .10	63.2 1.9
22.0	28.98 .15	35.0 0.2	43.20 .15	22.6 0.9	5.74 .24	29.6 2.6	24.42 .14	38.4 0.9	7.97 .14	61.1 2.1
31.9	29.14 .18	35.0 0.1	43.36 .18	21.8 0.5	6.03 .33	27.1 2.3	24.57 .17	37.4 1.1	8.14 .18	59.0 2.2
Apr. 10.9	29.34 .21	35.3 0.5	43.57 .22	21.5 0.1	6.41 .41	25.1 1.8	24.76 .20	36.1 1.3	8.34 .22	56.8 2.3
20.9	29.57 .24	36.0 0.8	43.81 .25	21.6 0.3	6.86 .48	23.5 1.3	24.98 .23	34.7 1.5	8.57 .25	54.5 2.3
30.8	29.83 .27	36.9 1.1	44.08 .28	22.0 0.7	7.38 .54	22.5 0.7	25.23 .26	33.1 1.7	8.84 .28	52.2 2.3
May 10.8	30.12 .29	38.2 1.4	44.37 .30	22.9 1.1	7.94 .58	22.0 0.2	25.50 .28	31.3 1.8	9.14 .31	49.9 2.2
20.8	30.42 .31	39.8 1.7	44.69 .32	24.2 1.4	8.53 .60	22.1 0.4	25.80 .30	29.4 1.9	9.46 .33	47.8 2.1
30.8	30.73 .31	41.6 1.9	45.01 .33	25.8 1.8	9.14 .60	22.9 1.0	26.10 .31	27.4 2.0	9.80 .34	45.8 1.9
June 9.7	31.04 .31	43.6 2.1	45.34 .32	27.8 2.1	9.74 .59	24.1 1.5	26.42 .31	25.5 2.0	10.14 .34	44.0 1.7
19.7	31.35 .30	45.7 2.2	45.66 .31	30.0 2.3	10.32 .56	26.0 2.1	26.73 .31	23.6 1.9	10.49 .34	42.4 1.4
29.7	31.64 .28	48.0 2.2	45.97 .29	32.4 2.4	10.87 .52	28.2 2.5	27.03 .29	21.7 1.8	10.82 .33	41.1 1.1
July 9.7	31.91 .26	50.2 2.2	46.25 .27	34.9 2.5	11.37 .47	30.9 2.9	27.31 .27	20.0 1.6	11.14 .30	40.2 0.8
19.6	32.16 .23	52.4 2.2	46.51 .24	37.4 2.6	11.80 .40	34.0 3.2	27.57 .24	18.5 1.4	11.43 .27	39.5 0.5
29.6	32.37 .19	54.5 2.1	46.72 .20	40.0 2.6	12.17 .33	37.3 3.4	27.79 .21	17.2 1.2	11.68 .23	39.2 0.1
Aug. 8.6	32.54 .15	56.5 1.9	46.90 .16	42.6 2.5	12.46 .25	40.8 3.6	27.98 .17	16.1 1.0	11.90 .19	39.3 0.2
18.5	32.68 .11	58.3 1.7	47.04 .12	45.0 2.4	12.66 .16	44.4 3.7	28.13 .13	15.3 0.7	12.07 .15	39.7 0.5
28.5	32.76 .07	60.0 1.5	47.14 .07	47.4 2.2	12.78 .08	48.1 3.7	28.23 .08	14.7 0.5	12.19 .10	40.4 0.8
Sept. 7.5	32.81 .03	61.4 1.3	47.19 .03	49.5 2.0	12.82 .01	51.8 3.6	28.29 .04	14.3 0.2	12.26 .05	41.4 1.1
17.5	32.82 .01	62.6 1.1	47.19 .01	51.4 1.8	12.77 .09	55.4 3.5	28.31 .00	14.2 0.0	12.28 .00	42.5 1.2
27.4	32.79 .05	63.5 0.8	47.16 .05	53.0 1.5	12.64 .16	58.7 3.2	28.29 .04	14.3 0.2	12.26 .04	43.8 1.4
Oct. 7.4	32.73 .07	64.2 0.6	47.10 .08	54.4 1.2	12.44 .23	61.9 3.0	28.24 .07	14.6 0.4	12.20 .08	45.3 1.4
17.4	32.64 .09	64.7 0.3	47.00 .10	55.5 0.9	12.17 .29	64.7 2.6	28.16 .09	15.0 0.5	12.10 .11	46.7 1.4
27.4	32.53 .11	64.9 0.1	46.89 .12	56.3 0.6	11.85 .35	67.1 2.2	28.06 .11	15.6 0.6	11.98 .13	48.0 1.3
Nov. 6.3	32.41 .12	64.9 0.1	46.76 .14	56.7 0.3	11.48 .39	69.0 1.7	27.95 .12	16.2 0.6	11.84 .15	49.3 1.2
16.3	32.28 .13	64.7 0.3	46.62 .14	56.9 0.0	11.07 .42	70.5 1.2	27.82 .13	16.9 0.7	11.68 .16	50.4 1.0
26.3	32.15 .13	64.3 0.5	46.48 .14	56.7 0.3	10.64 .44	71.4 0.6	27.69 .13	17.6 0.7	11.53 .16	51.3 0.8
Dec. 6.2	32.03 .12	63.6 0.7	46.33 .14	56.2 0.6	10.20 .44	71.8 0.0	27.57 .12	18.2 0.7	11.37 .15	51.9 0.5
16.2	31.91 .11	62.8 0.9	46.20 .13	55.4 0.9	9.76 .43	71.5 0.6	27.46 .11	18.9 0.6	11.22 .14	52.3 0.2
26.2	31.80 .10	61.9 1.0	46.08 .12	54.4 1.2	9.33 .41	70.7 1.1	27.35 .10	19.5 0.6	11.09 .12	52.3 0.1
36.2	31.71 .08	60.8 1.1	45.97 .10	53.1 1.4	8.94 .38	69.3 1.6	27.26 .08	20.0 0.5	10.98 .10	52.1 0.4

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*o* Andromedæ.		α Pegasi. (*Markab.*)		φ Aquarii.		*o* Cephei.		τ Pegasi.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*
	h m 22 57	° ′ +41 47	h m 22 59	° ′ +14 40	h m 23 9	° ′ − 6 34	h m 23 14	° ′ +67 33	h m 23 15	° ′ +23 11
	s	″	s	″	s	″	s	″	s	″
Jan. 1.2	19.40 .16	37.0 1.4	47.22 .10	12.3 1.1	9.17 .10	73.7 0.6	30.93 .46	75.8 1.0	41.74 .12	47.9 1.1
11.2	19.25 .14	35.4 1.8	47.13 .08	11.2 1.2	9.08 .08	74.2 0.5	30.50 .41	74.5 1.6	41.63 .10	46.6 1.3
21.1	19.12 .12	33.5 2.1	47.06 .06	10.0 1.2	9.01 .06	74.7 0.3	30.11 .36	72.6 2.1	41.54 .08	45.2 1.5
31.1	19.02 .08	31.3 2.3	47.01 .04	8.7 1.3	8.96 .04	74.9 0.2	29.78 .29	70.3 2.5	41.46 .06	43.7 1.6
Feb. 10.1	18.95 .05	29.0 2.4	46.98 .01	7.4 1.2	8.94 ,01	75.1 0.1	29.53 .21	67.7 2.8	41.41 .03	42.1 1.6
20.1	18.92 .00	26.6 2.4	46.98 .02	6.3 1.1	8.94 .01	75.0 0.1	29.37 .12	64.8 3.0	41.39 .00	40.5 1.5
Mar. 2.0	18.95 .05	24.2 2.3	47.02 .05	5.2 0.9	8.96 .04	74.8 0.3	29.30 .02	61.7 3.0	41.41 .03	39.0 1.4
12.0	19.02 .10	22.0 2.1	47.08 .09	4.4 0.7	9.02 .08	74.4 0.6	29.34 .09	58.7 3.0	41.46 .07	37.7 1.2
22.0	19.14 .15	20.0 1.8	47.19 .12	3.8 0.4	9.12 .11	73.7 0.8	29.48 .20	55.8 2.8	41.55 .11	36.6 0.9
31.9	19.31 .20	18.3 1.5	47.34 .16	3.5 0.1	9.25 .15	72.8 1.0	29.73 .30	53.1 2.5	41.68 .15	35.8 0.6
Apr. 10.9	19.54 .25	17.0 1.1	47.52 .20	3.5 0.2	9.42 .19	71.6 1.3	30.07 .39	50.8 2.1	41.86 .19	35.4 0.3
20.9	19.80 .29	16.2 0.6	47.73 .23	3.9 0.6	9.62 .22	70.2 1.5	30.51 .47	49.0 1.6	42.07 .23	35.3 0.1
30.9	20.11 .32	15.9 0.1	47.98 .26	4.6 0.9	9.86 .25	68.6 1.7	31.02 .54	47.6 1.1	42.32 .26	35.6 0.5
May 10.8	20.45 .35	16.0 0.4	48.26 .29	5.7 1.2	10.12 .28	66.9 1.8	31.60 .60	46.7 0.5	42.60 .29	36.3 0.9
20.8	20.81 .37	16.7 0.9	48.56 .30	7.1 1.5	10.41 .29	65.0 1.9	32.22 .63	46.5 0.0	42.90 .31	37.4 1.3
30.8	21.19 .38	17.9 1.4	48.87 .31	8.8 1.8	10.71 .31	63.0 2.0	32.87 .65	46.8 0.6	43.22 .32	38.8 1.6
June 9.7	21.57 .38	19.4 1.8	49.19 .32	10.7 2.0	11.02 .31	61.0 2.0	33.52 .65	47.7 1.2	43.55 .33	40.6 1.9
19.7	21.95 .37	21.5 2.2	49.50 .31	12.8 2.2	11.33 .31	59.1 1.9	34.17 .63	49.1 1.7	43.88 .33	42.6 2.1
29.7	22.31 .35	23.8 2.5	49.81 .30	15.0 2.3	11.64 .30	57.2 1.8	34.78 .60	51.1 2.2	44.20 .31	44.8 2.3
July 9.7	22.64 .32	26.5 2.8	50.09 .27	17.4 2.3	11.93 .28	55.4 1.7	35.36 .55	53.4 2.6	44.50 .29	47.2 2.4
19.6	22.94 .28	29.4 3.0	50.35 .25	19.7 2.3	12.19 .25	53.7 1.5	35.88 .48	56.2 2.9	44.79 .26	49.7 2.5
29.6	23.21 .24	32.4 3.1	50.58 .21	21.9 2.2	12.43 .22	52.3 1.3	36.33 .41	59.4 3.2	45.03 .23	52.2 2.5
Aug. 8.6	23.42 .19	35.5 3.1	50.78 .17	24.1 2.1	12.64 .19	51.1 1.1	36.70 .33	62.7 3.5	45.24 .19	54.7 2.5
18.6	23.59 .14	38.6 3.1	50.93 .13	26.2 2.0	12.80 .15	50.2 0.8	36.99 .25	66.3 3.6	45.42 .15	57.1 2.4
28.5	23.70 .09	41.7 3.0	51.05 .09	28.0 1.8	12.93 .10	49.5 0.6	37.20 .16	69.9 3.7	45.55 .11	59.4 2.2
Sept. 7.5	23.77 .04	44.7 2.9	51.12 .05	29.7 1.6	13.01 .06	49.0 0.3	37.31 .07	73.6 3.7	45.64 .07	61.6 2.0
17.5	23.78 .01	47.5 2.7	51.15 .01	31.2 1.3	13.05 .02	48.8 0.1	37.33 .02	77.2 3.6	45.68 .03	63.5 1.8
27.5	23.75 .05	50.1 2.5	51.14 .03	32.4 1.1	13.06 .01	48.9 0.1	37.27 .10	80.8 3.4	45.69 .01	65.2 1.6
Oct. 7.4	23.68 .09	52.5 2.2	51.10 .06	33.4 0.8	13.02 .05	49.1 0.3	37.12 .18	84.1 3.2	45.66 .04	66.7 1.3
17.4	23.57 .12	54.5 1.8	51.03 .08	34.1 0.6	12.96 .07	49.5 0.5	36.91 .25	87.2 2.9	45.60 .07	67.9 1.1
27.4	23.44 .15	56.2 1.5	50.94 .10	34.6 0.3	12.88 .09	50.0 0.6	36.62 .32	89.9 2.5	45.51 .09	68.8 0.8
Nov. 6.3	23.27 .17	57.5 1.1	50.82 .12	34.8 0.1	12.78 .11	50.6 0.7	36.27 .37	92.2 2.1	45.41 .11	69.4 0.5
16.3	23.09 .19	58.3 0.6	50.70 .12	34.7 0.2	12.66 .12	51.3 0.7	35.87 .42	94.1 1.6	45.28 .13	69.7 0.2
26.3	22.90 .19	58.7 0.2	50.58 .13	34.4 0.4	12.54 .12	52.0 0.7	35.44 .45	95.4 1.0	45.16 .13	69.7 0.1
Dec. 6.3	22.71 .19	58.7 0.3	50.45 .12	34.0 0.6	12.42 .12	52.7 0.7	34.98 .47	96.2 0.5	45.02 .13	69.4 0.4
16.2	22.51 .19	58.2 0.7	50.33 .12	33.2 0.8	12.30 .11	53.4 0.7	34.50 .47	96.3 0.1	44.89 .13	68.9 0.7
26.2	22.33 .18	57.2 1.2	50.21 .11	32.3 1.0	12.20 .10	54.1 0.6	34.03 .46	95.9 0.7	44.76 .13	68.0 1.0
36.2	22.16 .17	55.8 1.6	50.11 .10	31.2 1.1	12.10 .09	54.7 0.6	33.57 .44	94.9 1.2	44.63 .12	66.9 1.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Piscium.		λ Andromedæ.		ι Piscium.		γ Cephei.		i^1 Aquarii.	
	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *North.*	Right Ascension.	Declination *South.*
	h m 23 22	° ′ + 5 49	h m 23 32	° ′ +45 54	h m 23 34	° ′ + 5 5	h m 23 35	° ′ +77 4	h m 23 39	° ′ −18 49
	s	″	s	″	s	″	s	″	s	″
Jan. 1.2	54.34 .11	54.7 0.9	40.68 .20	79.1 1.2	49.10 .10	10.8 0.8	14.26 .83	53.3 0.6	1.60 .11	55.9 0.3
11.2	54.24 .09	53.8 0.9	40.49 .18	77.8 1.5	49.00 .09	10.0 0.8	13.42 .80	52.3 1.2	1.50 .10	56.1 0.1
21.2	54.16 .07	53.0 0.8	40.31 .16	76.1 1.8	48.91 .08	9.2 0.8	12.65 .73	50.8 1.8	1.40 .09	56.1 0.1
31.1	54.10 .05	52.1 0.8	40.16 .13	74.1 2.1	48.84 .06	8.4 0.8	11.97 .62	48.8 2.3	1.32 .07	55.8 0.4
Feb. 10.1	54.06 .03	51.4 0.7	40.05 .09	71.9 2.3	48.79 .04	7.6 0.7	11.41 .48	46.3 2.6	1.26 .04	55.3 0.6
20.1	54.04 .00	50.7 0.6	39.97 .05	69.5 2.4	48.76 .01	7.0 0.5	11.00 .33	43.5 2.9	1.23 .02	54.6 0.9
Mar. 2.0	54.06 .03	50.2 0.4	39.94 .00	67.0 2.4	48.76 .02	6.5 0.4	10.76 .15	40.5 3.1	1.23 .01	53.6 1.1
12.0	54.10 .06	49.9 0.2	39.97 .05	64.6 2.3	48.80 .05	6.2 0.1	10.69 .03	37.3 3.1	1.26 .05	52.4 1.3
22.0	54.18 .10	49.8 0.1	40.04 .11	62.4 2.1	48.87 .09	6.2 0.1	10.81 .21	34.2 3.0	1.32 .08	51.0 1.5
Apr. 1.0	54.30 .14	50.0 0.3	40.18 .16	60.4 1.8	48.98 .13	6.4 0.4	11.11 .39	31.3 2.8	1.42 .12	49.3 1.7
10.9	54.46 .17	50.5 0.6	40.38 .22	58.8 1.4	49.12 .16	6.9 0.6	11.59 .56	28.6 2.5	1.57 .16	47.5 1.9
20.9	54.65 .21	51.2 0.9	40.62 .27	57.5 1.0	49.30 .20	7.7 0.9	12.22 .71	26.4 2.1	1.75 .20	45.5 2.0
30.9	54.88 .24	52.3 1.2	40.92 .32	56.8 0.5	49.52 .23	8.8 1.2	13.00 .83	24.5 1.6	1.96 .23	43.4 2.1
May 10.9	55.13 .27	53.6 1.4	41.25 .35	56.4 0.1	49.77 .26	10.1 1.4	13.88 .93	23.2 1.1	2.21 .26	41.2 2.2
20.8	55.41 .29	55.2 1.7	41.62 .38	56.6 0.4	50.05 .29	11.6 1.7	14.85 1.00	22.4 0.5	2.49 .29	39.0 2.2
30.8	55.71 .31	57.0 1.9	42.02 .40	57.3 0.9	50.35 .30	13.4 1.8	15.88 1.04	22.2 0.1	2.79 .31	36.8 2.2
June 9.8	56.02 .31	58.9 2.0	42.42 .41	58.5 1.4	50.66 .31	15.3 2.0	16.93 1.05	22.6 0.7	3.11 .32	34.7 2.0
19.7	56.34 .31	61.0 2.1	42.83 .40	60.1 1.8	50.97 .31	17.3 2.0	17.98 1.03	23.6 1.2	3.43 .32	32.7 1.9
29.7	56.64 .30	63.1 2.1	43.22 .39	62.2 2.2	51.28 .30	19.4 2.1	18.99 .99	25.1 1.8	3.75 .32	30.9 1.7
July 9.7	56.94 .28	65.2 2.1	43.60 .36	64.5 2.5	51.58 .29	21.4 2.0	19.95 .92	27.1 2.2	4.06 .30	29.3 1.4
19.6	57.21 .26	67.2 2.0	43.95 .33	67.2 2.8	51.86 .27	23.4 2.0	20.82 .83	29.6 2.7	4.35 .28	28.0 1.2
29.6	57.45 .23	69.1 1.9	44.26 .29	70.0 2.9	52.11 .24	25.4 1.8	21.60 .72	32.4 3.0	4.62 .25	27.0 0.8
Aug. 8.6	57.66 .19	70.9 1.7	44.53 .25	73.1 3.1	52.33 .20	27.1 1.7	22.26 .59	35.6 3.3	4.86 .22	26.3 0.5
18.6	57.84 .16	72.5 1.5	44.75 .20	76.2 3.1	52.52 .17	28.7 1.5	22.78 .46	39.1 3.5	5.06 .18	26.0 0.2
28.5	57.97 .11	73.9 1.3	44.92 .14	79.3 3.1	52.66 .13	30.0 1.2	23.18 .32	42.7 3.7	5.21 .14	25.9 0.1
Sept. 7.5	58.07 .07	75.1 1.1	45.04 .09	82.4 3.0	52.77 .09	31.2 1.0	23.42 .18	46.5 3.8	5.33 .09	26.2 0.4
17.5	58.12 .04	76.0 0.8	45.11 .04	85.4 2.9	52.84 .05	32.0 0.8	23.53 .03	50.2 3.8	5.40 .05	26.7 0.6
27.5	58.14 .00	76.8 0.6	45.13 .00	88.3 2.7	52.87 .01	32.7 0.5	23.49 .11	54.0 3.7	5.43 .01	27.4 0.8
Oct. 7.4	58.12 .03	77.2 0.4	45.10 .05	90.9 2.5	52.87 .02	33.1 0.3	23.30 .25	57.6 3.5	5.43 .02	28.4 1.0
17.4	58.08 .06	77.5 0.2	45.03 .09	93.2 2.2	52.83 .05	33.3 0.1	22.98 .38	61.0 3.3	5.38 .06	29.5 1.1
27.4	58.00 .08	77.6 0.0	44.92 .12	95.3 1.9	52.77 .07	33.4 0.1	22.53 .51	64.2 2.9	5.32 .08	30.6 1.2
Nov. 6.4	57.91 .10	77.4 0.2	44.78 .15	97.0 1.5	52.69 .09	33.2 0.2	21.96 .62	66.9 2.6	5.22 .10	31.8 1.1
16.3	57.81 .11	77.2 0.4	44.62 .18	98.2 1.0	52.59 .10	32.8 0.4	21.30 .71	69.3 2.1	5.11 .12	32.9 1.1
26.3	57.69 .12	76.7 0.5	44.43 .19	99.0 0.6	52.49 .11	32.4 0.5	20.54 .79	71.1 1.6	4.99 .12	33.9 1.0
Dec. 6.3	57.58 .12	76.1 0.6	44.23 .20	99.4 0.1	52.37 .11	31.8 0.6	19.72 .84	72.4 1.0	4.86 .13	34.8 0.8
16.3	57.46 .11	75.4 0.7	44.03 .21	99.3 0.3	52.26 .11	31.1 0.7	18.86 .87	73.1 0.4	4.74 .13	35.6 0.7
26.2	57.35 .11	74.7 0.8	43.82 .21	98.8 0.8	52.15 .11	30.3 0.8	17.98 .87	73.2 0.2	4.61 .12	36.2 0.5
36.2	57.24 .10	73.8 0.9	43.62 .20	97.7 1.2	52.04 .10	29.5 0.9	17.12 .86	72.6 0.9	4.49 .11	36.5 0.3

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.		δ Sculptoris.				γ' Octantis.				Groombridge 4163.				ω Piscium.			
		Right Ascension.		Declination *South.*		Right Ascension.		Declination *South.*		Right Ascension.		Declination *North.*		Right Ascension.		Declination *North.*	
		h m 23 43		° ' −28 40		h m 23 46		° ' −82 33		h m 23 49		° ' +73 51		h m 23 54		° ' + 6 18	
		s		"		s		"		s		"		s		"	
Jan.	1.2	43.69	.14	64.3	0.1	12.20	1.55	101.4	1.5	58.04	.66	39.6	0.5	11.37	.11	42.8	0.8
	11.2	43.56	.12	64.2	0.2	10.72	1.41	99.7	2.0	57.38	.64	38.8	1.1	11.26	.10	42.0	0.8
	21.2	43.45	.10	63.9	0.5	9.39	1.24	97.5	2.5	56.76	.59	37.4	1.6	11.17	.09	41.2	0.8
	31.1	43.36	.08	63.2	0.8	8.25	1.04	94.8	2.9	56.20	.51	35.5	2.1	11.08	.08	40.4	0.8
Feb.	10.1	43.28	.06	62.2	1.1	7.32	.82	91.6	3.3	55.74	.41	33.2	2.5	11.02	.06	39.6	0.7
	20.1	43.24	.03	60.9	1.4	6.61	.58	88.2	3.6	55.38	.29	30.5	2.8	10.97	.03	39.0	0.6
Mar.	2.1	43.23	.00	59.4	1.6	6.15	.33	84.5	3.7	55.15	.16	27.5	3.0	10.95	.00	38.4	0.4
	12.0	43.25	.04	57.6	1.9	5.94	.08	80.7	3.8	55.06	.02	24.5	3.1	10.97	.03	38.1	0.2
	22.0	43.31	.08	55.6	2.1	5.99	.18	76.8	3.9	55.12	.13	21.4	3.0	11.02	.07	38.0	0.0
Apr.	1.0	43.41	.12	53.4	2.2	6.29	.43	73.0	3.8	55.33	.28	18.5	2.8	11.10	.11	38.2	0.3
	11.0	43.55	.16	51.1	2.4	6.84	.67	69.3	3.6	55.68	.42	15.8	2.5	11.23	.15	38.6	0.6
	20.9	43.73	.20	48.7	2.4	7.62	.89	65.8	3.4	56.16	.54	13.5	2.1	11.40	.19	39.3	0.8
	30.9	43.95	.24	46.2	2.5	8.62	1.10	62.5	3.1	56.76	.65	11.6	1.7	11.60	.22	40.2	1.1
May	10.9	44.21	.27	43.7	2.4	9.82	1.29	59.6	2.7	57.46	.74	10.2	1.1	11.85	.26	41.5	1.4
	20.8	44.49	.30	41.3	2.4	11.19	1.44	57.0	2.3	58.24	.81	9.3	0.6	12.12	.28	43.0	1.6
	30.8	44.81	.32	39.0	2.2	12.69	1.56	55.0	1.8	59.08	.85	9.0	0.0	12.41	.30	44.7	1.8
June	9.8	45.14	.33	36.8	2.0	14.30	1.64	53.4	1.3	59.94	.87	9.3	0.6	12.71	.31	46.5	1.9
	19.8	45.47	.34	34.9	1.8	15.97	1.69	52.4	0.7	60.81	.86	10.1	1.1	13.03	.31	48.5	2.0
	29.7	45.81	.33	33.3	1.5	17.66	1.68	51.9	0.2	61.67	.84	11.5	1.6	13.34	.31	50.6	2.1
July	9.7	46.14	.32	31.9	1.2	19.31	1.63	52.0	0.4	62.48	.79	13.4	2.1	13.64	.30	52.6	2.0
	19.7	46.45	.30	30.9	0.8	20.89	1.52	52.7	0.9	63.24	.72	15.7	2.5	13.93	.28	54.6	2.0
	29.6	46.74	.27	30.2	0.4	22.35	1.38	53.9	1.5	63.92	.64	18.4	2.9	14.19	.25	56.6	1.9
Aug.	8.6	46.99	.23	30.0	0.1	23.63	1.18	55.6	1.9	64.51	.54	21.5	3.2	14.43	.22	58.4	1.7
	18.6	47.21	.19	30.1	0.3	24.70	.95	57.8	2.3	65.00	.44	24.9	3.5	14.63	.18	60.0	1.5
	28.6	47.38	.15	30.6	0.6	25.52	.68	60.3	2.7	65.39	.33	28.4	3.6	14.79	.14	61.4	1.3
Sept.	7.5	47.50	.10	31.4	0.9	26.06	.39	63.1	2.9	65.66	.21	32.1	3.7	14.92	.11	62.6	1.1
	17.5	47.58	.06	32.5	1.2	26.30	.08	66.2	3.1	65.81	.09	35.8	3.7	15.00	.07	63.6	0.9
	27.5	47.62	.01	33.8	1.4	26.23	.23	69.2	3.1	65.84	.02	39.5	3.6	15.05	.03	64.4	0.6
Oct.	7.5	47.61	.03	35.3	1.5	25.85	.53	72.3	3.0	65.77	.13	43.1	3.5	15.07	.00	64.9	0.4
	17.4	47.56	.06	36.8	1.6	25.16	.82	75.2	2.8	65.58	.24	46.5	3.3	15.05	.03	65.2	0.2
	27.4	47.48	.09	38.4	1.6	24.21	1.08	77.8	2.4	65.28	.34	49.7	3.0	15.01	.06	65.2	0.0
Nov.	6.4	47.38	.11	40.0	1.5	23.01	1.30	80.0	2.0	64.89	.44	52.5	2.6	14.94	.08	65.1	0.2
	16.4	47.26	.13	41.4	1.3	21.62	1.47	81.8	1.5	64.40	.52	54.9	2.2	14.86	.09	64.8	0.4
	26.3	47.12	.14	42.6	1.1	20.09	1.58	82.9	0.9	63.85	.58	56.8	1.6	14.76	.10	64.4	0.5
Dec.	6.3	46.97	.15	43.6	0.9	18.47	1.64	83.5	0.3	63.24	.63	58.2	1.1	14.65	.11	63.9	0.6
	16.3	46.82	.15	44.4	0.6	16.82	1.64	83.4	0.4	62.57	.67	59.0	0.5	14.54	.11	63.2	0.7
	26.2	46.68	.14	44.8	0.3	15.20	1.59	82.7	1.0	61.90	.68	59.2	0.1	14.42	.11	62.5	0.8
	36.2	46.54	.13	45.0	0.0	13.65	1.48	81.4	1.5	61.22	.67	58.8	0.6	14.31	.10	61.7	0.8

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Jan. 1	18 47 20.37	21.04	−23 0 19.6	18.9	11.042	+12.49	+3 46.34	16 17.13	1 10.99	18 43 34.10
2	18 51 45.21	45.97	22 55 6.0	5.1	11.028	13.63	4 14.64	16 17.13	1 10.94	18 47 30.66
3	18 56 9.70	10.55	22 49 25.2	24.1	11.011	14.77	4 42.57	16 17.12	1 10.89	18 51 27.22
4	19 0 33.77	34.70	22 43 17.1	15.8	10.994	15.90	5 10.11	16 17.11	1 10.84	18 55 23.77
5	19 4 57.44	58.45	22 36 41.9	40.4	10.976	17.02	5 37.21	16 17.09	1 10.78	18 59 20.33
6	19 9 20.63	21.72	−22 29 40.1	38.4	10.957	+18.13	+6 3.85	16 17.07	1 10.72	19 3 16.89
7	19 13 43.32	44.49	22 22 11.6	9.6	10.935	19.24	6 29.99	16 17.04	1 10.65	19 7 13.45
8	19 18 5.49	6.74	22 14 16.8	14.5	10.913	20.33	6 55.61	16 17.01	1 10.58	19 11 10.00
9	19 22 27.13	28.45	22 5 55.9	53.3	10.890	21.41	7 20.69	16 16.97	1 10.51	19 15 6.56
10	19 26 48.20	49.59	21 57 9.1	6.2	10.865	22.48	7 45.19	16 16.93	1 10.43	19 19 3.12
11	19 31 8.65	10.11	−21 47 56.7	53.5	10.839	+23.54	+8 9.09	16 16.89	1 10.35	19 22 59.68
12	19 35 28.51	30.04	21 38 19.0	15.5	10.813	24.59	8 32.41	16 16.84	1 10.27	19 26 56.23
13	19 39 47.74	49.33	21 28 16.2	12.3	10.787	25.63	8 55.08	16 16.79	1 10.18	19 30 52.79
14	19 44 6.31	7.96	21 17 48.5	44.3	10.760	26.65	9 17.11	16 16.73	1 10.09	19 34 49.35
15	19 48 24.23	25.94	21 6 56.4	51.9	10.732	27.67	9 38.47	16 16.66	1 10.00	19 38 45.90
16	19 52 41.46	43.23	−20 55 39.9	35.2	10.704	+28.67	+9 59.14	16 16.58	1 9.91	19 42 42.46
17	19 56 58.01	59.83	20 43 59.5	54.5	10.675	29.67	10 19.13	16 16.50	1 9.81	19 46 39.02
18	20 1 13.86	15.73	20 31 55.5	50.2	10.645	30.65	10 38.43	16 16.42	1 9.71	19 50 35.58
19	20 5 28.98	30.90	20 19 28.1	22.5	10.615	31.62	10 57.00	16 16.34	1 9.61	19 54 32.13
20	20 9 43.38	45.35	20 6 37.8	31.8	10.584	32.57	11 14.85	16 16.25	1 9.51	19 58 28.69
21	20 13 57.03	59.05	−19 53 24.9	18.4	10.553	+33.51	+11 31.93	16 16.16	1 9.41	20 2 25.25
22	20 18 9.94	12.00	19 39 49.7	42.8	10.528	34.42	11 48.29	16 16.06	1 9.31	20 6 21.80
23	20 22 22.09	24.19	19 25 52.5	45.3	10.490	35.33	12 3.87	16 15.96	1 9.20	20 10 18.36
24	20 26 33.47	35.61	19 11 33.7	26.2	10.459	36.23	12 18.70	16 15.85	1 9.09	20 14 14.92
25	20 30 44.07	46.24	18 56 53.7	45.9	10.426	37.10	12 32.75	16 15.73	1 8.98	20 18 11.47
26	20 34 53.89	56.09	−18 41 52.9	44.7	10.393	+37.96	+12 46.00	16 15.60	1 8.87	20 22 8.03
27	20 39 2.93	5.16	18 26 31.5	23.1	10.360	38.80	12 58.47	16 15.48	1 8.75	20 26 4.58
28	20 43 11.17	13.43	18 10 50.1	41.3	10.327	39.63	13 10.14	16 15.35	1 8.64	20 30 1.14
29	20 47 18.61	20.90	17 54 49.1	40.0	10.293	40.44	13 21.00	16 15.22	1 8.52	20 33 57.70
30	20 51 25.22	27.53	17 38 29.0	19.6	10.259	41.24	13 31.06	16 15.08	1 8.41	20 37 54.25
31	20 55 31.01	33.34	−17 21 50.0	40.4	10.225	+42.01	+13 40.28	16 14.94	1 8.29	20 41 50.81
Feb. 1	20 59 35.98	38.32	17 3 52.6	42.8	10.191	42.77	13 48.70	16 14.80	1 8.18	20 45 47.36
2	21 3 40.12	42.47	16 47 37.3	27.1	10.156	43.50	13 56.27	16 14.65	1 8.06	20 49 43.92
3	21 7 43.43	45.79	16 29 64.4	53.9	10.121	44.22	14 3.01	16 14.50	1 7.95	20 53 40.47
4	21 11 45.90	48.27	16 12 14.6	3.9	10.086	44.92	14 8.92	16 14.34	1 7.83	20 57 37.03
5	21 15 47.54	49.92	−15 53 68.0	57.1	10.051	+45.61	+14 14.00	16 14.17	1 7.72	21 1 33.58
6	21 19 48.34	50.73	15 35 45.2	34.1	10.017	46.28	14 18.25	16 14.00	1 7.60	21 5 30.14
7	21 23 48.33	50.72	15 16 66.6	55.3	9.983	46.94	14 21.67	16 13.83	1 7.48	21 9 26.70
8	21 27 47.50	49.89	14 58 12.5	1.1	9.949	47.57	14 24.27	16 13.66	1 7.37	21 13 23.25
9	21 31 45.86	48.25	14 38 63.3	51.7	9.917	48.19	14 26.07	16 13.48	1 7.26	21 17 19.80
10	21 35 43.41	45.80	−14 19 39.7	27.8	9.881	+48.78	+14 27.06	16 13.30	1 7.15	21 21 16.36
11	21 39 40.17	42.55	13 59 61.7	49.8	9.849	49.36	14 27.26	16 13.11	1 7.04	21 25 12.91
12	21 43 36.16	38.53	13 39 70.0	58.0	9.817	49.93	14 26.68	16 12.92	1 6.93	21 29 9.47
13	21 47 31.39	33.75	13 20 4.9	52.8	9.785	50.49	14 25.35	16 12.73	1 6.82	21 33 6.02
14	21 51 25.85	28.20	12 59 46.7	34.5	9.754	51.02	14 23.25	16 12.54	1 6.71	21 37 2.58
15	21 55 19.58	21.92	−12 39 15.8	3.5	9.724	+51.54	+14 20.41	16 12.34	1 6.61	21 40 59.13
16	21 59 12.59	14.91	−12 18 32.9	20.5	9.694	+52.03	+14 16.85	16 12.14	1 6.50	21 44 55.69

Note.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Feb. 16	21 59 12.59	14.91	−12 18 32.9	20.5	9.694	+52.03	+14 16.85	16 12.14	1 6.50	21 44 55.69
17	22 3 4.89	7.19	11 57 38.0	25.6	9.665	52.52	14 12.59	16 11.93	1 6.40	21 48 52.24
18	22 6 56.49	58.77	11 36 31.8	19.4	9.636	52.99	14 7.65	16 11.72	1 6.30	21 52 48.80
19	22 10 47.43	49.69	11 15 14.5	2.0	9.608	53.44	14 2.02	16 11.51	1 6.21	21 56 45.35
20	22 14 37.71	39.95	10 53 46.4	33.9	9.581	53.88	13 55.75	16 11.29	1 6.11	22 0 41.90
21	22 18 27.35	29.56	−10 31 68.3	55.8	9.555	+54.30	+13 48.82	16 11.07	1 6.02	22 4 38.46
22	22 22 16.35	18.53	10 10 20.2	7.7	9.530	54.69	13 41.27	16 10.85	1 5.93	22 8 35.01
23	22 26 4.75	6.90	9 48 22.8	10.4	9.505	55.08	13 33.11	16 10.63	1 5.84	22 12 31.56
24	22 29 52.55	54.67	9 26 16.3	3.9	9.480	55.44	13 24.36	16 10.40	1 5.75	22 16 28.12
25	22 33 39.78	41.87	9 3 61.3	49.0	9.456	55.79	13 15.02	16 10.17	1 5.66	22 20 24.67
26	22 37 26.44	28.50	− 8 41 38.1	25.9	9.433	+56.13	+13 5.13	16 9.93	1 5.58	22 24 21.22
27	22 41 12.55	14.58	8 18 67.1	55.0	9.410	56.44	12 54.68	16 9.69	1 5.50	22 28 17.78
28	22 44 58.13	60.13	7 56 28.8	16.8	9.388	56.74	12 43.70	16 9.45	1 5.43	22 32 14.33
Mar. 1	22 48 43.19	45.16	7 33 43.7	31.8	9.367	57.02	12 32.20	16 9.21	1 5.36	22 36 10.88
2	22 52 27.73	29.66	7 10 51.9	40.1	9.346	57.27	12 20.19	16 8.97	1 5.29	22 40 7.44
3	22 56 11.78	13.67	− 6 47 54.2	42.5	9.326	+57.52	+12 7.69	16 8.72	1 5.22	22 44 3.99
4	22 59 55.35	57.20	6 24 50.8	39.3	9.306	57.74	11 54.70	16 8.47	1 5.15	22 48 0.54
5	23 3 38.44	40.25	6 1 42.3	31.0	9.287	57.95	11 41.24	16 8.22	1 5.08	22 51 57.09
6	23 7 21.09	22.86	5 38 28.9	17.8	9.268	58.15	11 27.34	16 7.97	1 5.02	22 55 53.65
7	23 11 3.32	5.05	5 15 11.1	0.2	9.250	58.33	11 13.02	16 7.72	1 4.96	22 59 50.20
8	23 14 45.12	46.81	− 4 51 49.3	38.6	9.234	+58.49	+10 58.27	16 7.47	1 4.90	23 3 46.75
9	23 18 26.54	28.19	4 28 23.8	13.3	9.218	58.64	10 43.13	16 7.21	1 4.85	23 7 43.30
10	23 22 7.58	9.19	4 4 55.0	44.7	9.203	58.77	10 27.62	16 6.95	1 4.80	23 11 39.86
11	23 25 48.28	49.85	3 41 23.2	13.1	9.189	58.88	10 11.77	16 6.69	1 4.75	23 15 36.41
12	23 29 28.65	30.18	3 17 48.8	38.9	9.175	58.98	9 55.58	16 6.43	1 4.70	23 19 32.96
13	23 33 8.71	10.19	− 2 54 12.2	2.6	9.163	+59.06	+9 39.10	16 6.17	1 4.65	23 23 29.52
14	23 36 48.49	49.92	2 30 33.9	24.5	9.152	59.13	9 22.32	16 5.90	1 4.61	23 27 26.07
15	23 40 28.01	29.39	2 6 53.9	44.8	9.142	59.19	9 5.29	16 5.63	1 4.57	23 31 22.62
16	23 44 7.30	8.64	1 43 12.9	4.1	9.132	59.24	8 48.02	16 5.36	1 4.54	23 35 19.18
17	23 47 46.38	47.68	1 19 31.1	22.6	9.124	59.26	8 30.56	16 5.09	1 4.51	23 39 15.73
18	23 51 25.26	26.52	− 0 55 48.7	40.5	9.117	+59.27	+8 12.89	16 4.82	1 4.49	23 43 12.28
19	23 55 3.98	5.19	0 31 66.2	58.3	9.111	59.27	7 55.04	16 4.55	1 4.47	23 47 8.83
20	23 58 42.55	43.72	− 0 8 24.0	16.4	9.105	59.25	7 37.07	16 4.28	1 4.45	23 51 5.38
21	0 2 21.01	22.13	+ 0 15 17.6	24.9	9.100	59.22	7 18.97	16 4.01	1 4.43	23 55 1.94
22	0 5 59.37	60.45	0 38 58.3	65.3	9.097	59.17	7 0.79	16 3.73	1 4.41	23 58 58.49
23	0 9 37.66	38.70	+ 1 2 37.8	44.5	9.095	+59.11	+6 42.52	16 3.45	1 4.40	0 2 55.04
24	0 13 15.90	16.89	1 26 15.6	22.0	9.093	59.03	6 24.21	16 3.18	1 4.39	0 6 51.60
25	0 16 54.10	55.04	1 49 51.5	57.6	9.092	58.95	6 5.87	16 2.90	1 4.39	0 10 48.15
26	0 20 32.29	33.18	2 13 24.7	30.5	9.092	58.83	5 47.52	16 2.63	1 4.38	0 14 44.70
27	0 24 10.48	11.32	2 36 55.3	60.8	9.093	58.71	5 29.16	16 2.35	1 4.38	0 18 41.25
28	0 27 48.71	49.50	+ 3 0 22.8	28.0	9.094	+58.57	+5 10.85	16 2.07	1 4.38	0 22 37.80
29	0 31 26.98	27.73	3 23 46.9	51.7	9.096	58.40	4 52.57	16 1.80	1 4.39	0 26 34.36
30	0 35 5.30	6.01	3 47 7.0	11.5	9.099	58.23	4 34.33	16 1.52	1 4.40	0 30 30.91
31	0 38 43.70	44.36	4 10 22.9	27.1	9.102	58.05	4 16.17	16 1.25	1 4.41	0 34 27.46
32	0 42 22.18	22.79	4 33 34.2	38.1	9.106	57.86	3 58.12	16 0.97	1 4.42	0 38 24.01
33	0 46 0.76	1.32	+ 4 56 40.5	44.1	9.110	+57.64	+3 40.15	16 0.69	1 4.44	0 42 20.57
34	0 49 39.46	39.98	+ 5 19 41.5	44.8	9.115	+57.42	+3 22.29	16 0.42	1 4.46	0 46 17.12

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Apr. 1	0 42 22.18	22.79	+ 4 33 34.2	38.1	9.106	+57.86	+3 58.12	16 0.97	1 4.42	0 38 24.01
2	0 46 0.76	1.32	4 56 40.5	44.1	9.110	57.64	3 40.15	16 0.69	1 4.44	0 42 20.57
3	0 49 39.46	39.98	5 19 41.5	44.8	9.115	57.42	3 22.29	16 0.42	1 4.46	0 46 17.12
4	0 53 18.30	18.77	5 42 36.6	39.6	9.121	57.17	3 4.58	16 0.14	1 4.49	0 50 13.67
5	0 56 57.28	57.71	6 5 25.8	28.5	9.127	56.91	2 47.02	15 59.87	1 4.52	0 54 10.23
6	1 0 36.42	36.80	+ 6 28 8.5	10.9	9.135	+56.64	+2 29.61	15 59.59	1 4.55	0 58 6.78
7	1 4 15.76	16.10	6 50 44.4	46.5	9.143	56.35	2 12.39	15 59.31	1 4.58	1 2 3.33
8	1 7 55.29	55.59	7 13 13.2	15.0	9.152	56.04	1 55.38	15 59.04	1 4.61	1 5 59.88
9	1 11 35.04	35.30	7 35 34.7	36.3	9.162	55.73	1 38.58	15 58.76	1 4.65	1 9 56.44
10	1 15 15.05	15.26	7 57 48.5	49.8	9.173	55.41	1 22.04	15 58.49	1 4.69	1 13 52.99
11	1 18 55.29	55.46	+ 8 19 54.2	55.2	9.184	+55.08	+1 5.74	15 58.22	1 4.73	1 17 49.54
12	1 22 35.82	35.95	8 41 51.6	52.4	9.196	54.72	0 49.72	15 57.95	1 4.78	1 21 46.10
13	1 26 16.65	16.74	9 3 40.2	40.8	9.209	54.35	0 34.00	15 57.68	1 4.82	1 25 42.65
14	1 29 57.80	57.85	9 25 19.8	20.1	9.222	53.96	0 18.59	15 57.41	1 4.87	1 29 39.20
15	1 33 39.28	39.29	9 46 50.1	50.2	9.236	53.56	+0 3.52	15 57.15	1 4.92	1 33 35.76
16	1 37 21.12	21.10	+10 8 10.5	10.4	9.251	+53.15	−0 11.19	15 56.89	1 4.97	1 37 32.31
17	1 41 3.32	3.26	10 29 21.1	20.8	9.267	52.73	0 25.54	15 56.63	1 5.02	1 41 28.86
18	1 44 45.93	45.83	10 50 21.6	21.1	9.284	52.29	0 39.48	15 56.37	1 5.08	1 45 25.42
19	1 48 28.95	28.82	11 11 11.4	10.7	9.301	51.84	0 53.01	15 56.11	1 5.14	1 49 21.97
20	1 52 12.38	12.21	11 31 50.2	49.3	9.319	51.38	1 6.14	15 55.85	1 5.20	1 53 18.52
21	1 55 56.25	56.05	+11 52 17.6	16.5	9.338	+50.91	−1 18.82	15 55.59	1 5.26	1 57 15.08
22	1 59 40.59	40.36	12 12 33.6	32.2	9.357	50.41	1 31.03	15 55.33	1 5.33	2 1 11.64
23	2 3 25.38	25.12	12 32 37.4	35.9	9.377	49.91	1 42.79	15 55.07	1 5.39	2 5 8.19
24	2 7 10.69	10.40	12 52 29.0	27.4	9.397	49.39	1 54.04	15 54.82	1 5.46	2 9 4.74
25	2 10 56.46	56.14	13 12 8.1	6.4	9.417	48.85	2 4.81	15 54.57	1 5.53	2 13 1.29
26	2 14 42.74	42.39	+13 31 34.2	32.4	9.438	+48.31	−2 15.09	15 54.32	1 5.60	2 16 57.85
27	2 18 29.53	29.15	13 50 47.0	45.1	9.459	47.75	2 24.85	15 54.07	1 5.68	2 20 54.40
28	2 22 16.83	16.43	14 9 46.1	44.1	9.481	47.16	2 34.10	15 53.82	1 5.75	2 24 50.96
29	2 26 4.65	4.23	14 28 31.3	29.2	9.503	46.57	2 42.84	15 53.58	1 5.83	2 28 47.51
30	2 29 52.99	52.54	14 46 62.1	59.9	9.525	45.97	2 51.06	15 53.34	1 5.91	2 32 44.06
May 1	2 33 41.85	41.38	+15 5 18.4	16.2	9.547	+45.36	−2 58.75	15 53.10	1 5.99	2 36 40.62
2	2 37 31.24	30.75	15 23 19.5	17.3	9.569	44.72	3 5.93	15 52.87	1 6.07	2 40 37.18
3	2 41 21.16	20.65	15 41 5.4	3.1	9.591	44.08	3 12.55	15 52.64	1 6.15	2 44 33.73
4	2 45 11.62	11.09	15 58 35.6	33.3	9.613	43.43	3 18.65	15 52.41	1 6.23	2 48 30.28
5	2 49 2.61	2.07	16 15 50.0	47.6	9.636	42.75	3 24.22	15 52.18	1 6.31	2 52 26.84
6	2 52 54.16	53.60	+16 32 48.1	45.7	9.659	+42.07	−3 29.23	15 51.95	1 6.39	2 56 23.40
7	2 56 46.25	45.68	16 49 29.8	27.4	9.682	41.38	3 33.69	15 51.73	1 6.47	3 0 19.95
8	3 0 38.88	38.30	17 5 54.6	52.1	9.705	40.68	3 37.61	15 51.51	1 6.55	3 4 16.50
9	3 4 32.08	31.49	17 21 62.2	59.7	9.728	39.96	3 40.97	15 51.29	1 6.63	3 8 13.06
10	3 8 25.83	25.23	17 37 52.4	49.9	9.751	39.22	3 43.78	15 51.08	1 6.71	3 12 9.62
11	3 12 20.14	19.53	+17 53 24.9	22.4	9.775	+38.48	−3 46.02	15 50.87	1 6.80	3 16 6.17
12	3 16 15.01	14.39	18 8 39.5	37.1	9.798	37.73	3 47.71	15 50.66	1 6.88	3 20 2.73
13	3 20 10.45	9.83	18 23 35.8	33.4	9.822	36.97	3 48.83	15 50.46	1 6.96	3 23 59.28
14	3 24 6.46	5.84	18 38 13.6	11.3	9.845	36.19	3 49.37	15 50.26	1 7.04	3 27 55.84
15	3 28 3.04	2.41	18 52 32.6	30.3	9.869	35.40	3 49.35	15 50.06	1 7.12	3 31 52.39
16	3 31 60.20	59.57	+19 6 32.5	30.3	9.893	+34.60	−3 48.75	15 49.86	1 7.20	3 35 48.95
17	3 35 57.94	57.31	+19 20 13.0	10.8	9.917	+33.78	−3 47.58	15 49.66	1 7.28	3 39 45.50

Note.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
May 17	3 35 57.94	57.31	+19 20 13.0	10.8	9.917	+33.78	−3 47.58	15 49.66	1 7.28	3 39 45.50
18	3 39 56.24	55.61	19 33 34.0	31.9	9.941	32.96	3 45.83	15 49.47	1 7.36	3 43 42.06
19	3 43 55.11	54.49	19 46 35.1	33.0	9.965	32.13	3 43.52	15 49.28	1 7.44	3 47 38.62
20	3 47 54.55	53.93	19 59 16.1	14.1	9.989	31.29	3 40.64	15 49.10	1 7.52	3 51 35.17
21	3 51 54.56	53.95	20 11 36.7	34.8	10.012	30.42	3 37.19	15 48.92	1 7.59	3 55 31.73
22	3 55 55.11	54.51	+20 23 36.5	34.7	10.035	+29.56	−3 33.19	15 48.75	1 7.67	3 59 28.29
23	3 59 56.22	55.63	20 35 15.6	13.9	10.058	28.69	3 28.63	15 48.58	1 7.74	4 3 24.84
24	4 3 57.87	57.29	20 46 33.5	31.9	10.080	27.80	3 23.53	15 48.41	1 7.81	4 7 21.40
25	4 7 60.04	59.48	20 57 30.0	28.5	10.101	26.90	3 17.90	15 48.25	1 7.88	4 11 17.96
26	4 12 2.73	2.18	21 8 4.9	3.5	10.122	26.00	3 11.77	15 48.09	1 7.95	4 15 14.51
27	4 16 5.93	5.40	+21 18 17.9	16.6	10.142	+25.08	−3 5.14	15 47.93	1 8.02	4 19 11.07
28	4 20 9.60	9.09	21 28 8.9	7.7	10.162	24.16	2 58.03	15 47.78	1 8.08	4 23 7.62
29	4 24 13.73	13.22	21 37 37.6	36.5	10.181	23.23	2 50.46	15 47.63	1 8.14	4 27 4.18
30	4 28 18.29	17.82	21 46 43.8	42.8	10.199	22.29	2 42.45	15 47.48	1 8.20	4 31 0.74
31	4 32 23.28	22.84	21 55 27.2	26.3	10.216	21.34	2 34.02	15 47.33	1 8.26	4 34 57.30
June 1	4 36 28.68	28.26	+22 3 47.8	46.9	10.232	+20.37	−2 25.19	15 47.19	1 8.32	4 38 53.85
2	4 40 34.46	34.06	22 11 45.3	44.5	10.248	19.41	2 15.96	15 47.06	1 8.38	4 42 50.41
3	4 44 40.60	40.23	22 19 19.6	18.9	10.264	18.44	2 6.37	15 46.93	1 8.44	4 46 46.97
4	4 48 47.11	46.77	22 26 30.6	30.0	10.278	17.47	1 56.44	15 46.80	1 8.49	4 50 43.52
5	4 52 53.93	53.62	22 33 18.0	17.5	10.292	16.49	1 46.17	15 46.68	1 8.54	4 54 40.08
6	4 57 1.07	0.79	+22 39 41.7	41.3	10.304	+15.50	−1 35.58	15 46.57	1 8.59	4 58 36.64
7	5 1 8.50	8.25	22 45 41.7	41.4	10.315	14.51	1 24.71	15 46.46	1 8.63	5 2 33.20
8	5 5 16.20	15.98	22 51 17.7	17.4	10.326	13.50	1 13.56	15 46.35	1 8.67	5 6 29.75
9	5 9 24.16	23.97	22 56 29.6	29.4	10.336	12.49	1 2.16	15 46.24	1 8.70	5 10 26.31
10	5 13 32.36	32.20	23 1 17.3	17.1	10.346	11.48	0 50.52	15 46.13	1 8.73	5 14 22.87
11	5 17 40.77	40.64	+23 5 40.9	40.8	10.355	+10.47	−0 38.65	15 46.03	1 8.76	5 18 19.42
12	5 21 49.39	49.30	23 9 40.1	40.0	10.362	9.46	0 26.58	15 45.94	1 8.78	5 22 15.98
13	5 25 58.19	58.14	23 13 14.8	14.8	10.369	8.44	0 14.34	15 45.85	1 8.80	5 26 12.54
14	5 30 7.15	7.13	23 16 24.9	24.9	10.376	7.41	−0 1.94	15 45.76	1 8.82	5 30 9.10
15	5 34 16.26	16.28	23 19 10.6	10.6	10.382	6.39	+0 10.62	15 45.68	1 8.84	5 34 5.65
16	5 38 25.52	25.58	+23 21 31.5	31.5	10.387	+ 5.36	+0 23.31	15 45.61	1 8.86	5 38 2.21
17	5 42 34.87	34.97	23 23 27.7	27.7	10.391	4.33	0 36.11	15 45.54	1 8.87	5 41 58.77
18	5 46 44.32	44.46	23 24 59.1	59.1	10.395	3.29	0 49.00	15 45.47	1 8.88	5 45 55.33
19	5 50 53.84	54.02	23 26 5.7	5.7	10.397	2.26	1 1.96	15 45.41	1 8.88	5 49 51.88
20	5 55 3.40	3.62	23 26 47.6	47.6	10.398	1.23	1 14.97	15 45.35	1 8.88	5 53 48.44
21	5 59 12.99	13.24	+23 27 4.6	4.6	10.399	+ 0.19	+1 28.01	15 45.29	1 8.87	5 57 45.00
22	6 3 22.57	22.86	23 26 56.7	56.7	10.399	− 0.84	1 41.04	15 45.24	1 8.87	6 1 41.56
23	6 7 32.12	32.44	23 26 24.0	24.0	10.397	1.88	1 54.04	15 45.19	1 8.87	6 5 38.11
24	6 11 41.62	41.98	23 25 26.5	26.4	10.394	2.91	2 6.98	15 45.15	1 8.87	6 9 34.67
25	6 15 51.04	51.43	23 24 4.3	4.2	10.390	3.94	2 19.84	15 45.11	1 8.86	6 13 31.23
26	6 20 0.34	0.77	+23 22 17.3	17.1	10.385	− 4.97	+2 32.59	15 45.08	1 8.85	6 17 27.78
27	6 24 9.50	9.96	23 20 5.7	5.5	10.379	6.00	2 45.18	15 45.05	1 8.83	6 21 24.34
28	6 28 18.51	19.01	23 17 29.6	29.3	10.371	7.02	2 57.63	15 45.03	1 8.81	6 25 20.90
29	6 32 27.32	27.86	23 14 28.9	28.5	10.363	8.04	3 9.88	15 45.01	1 8.78	6 29 17.46
30	6 36 35.90	36.48	23 11 3.7	3.2	10.353	9.06	3 21.90	15 44.99	1 8.75	6 33 14.01
31	6 40 44.23	44.84	+23 7 14.3	13.7	10.342	−10.07	+3 33.68	15 44.98	1 8.71	6 37 10.57
32	6 44 52.30	52.94	+23 2 60.6	59.9	10.330	−11.07	+3 45.20	15 44.98	1 8.67	6 41 7.13

Note.—For mean time interval of semidiameter passing meridian, subtract $0^s.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
July 1	6 40 44.23	44.84	+23 7 14.3	13.7	10.342	−10.07	+3 33.68	15 44.98	1 8.71	6 37 10.57
2	6 44 52.30	52.94	23 2 60.6	59.9	10.330	11.07	3 45.20	15 44.98	1 8.67	6 41 7.13
3	6 49 0.07	0.74	22 58 22.9	22.1	10.318	12.07	3 56.42	15 44.98	1 8.63	6 45 3.69
4	6 53 7.54	8.24	22 53 21.2	20.3	10.304	13.07	4 7.32	15 44.98	1 8.58	6 49 0.24
5	6 57 14.67	15.40	22 47 55.5	54.5	10.290	14.06	4 17.90	15 44.98	1 8.53	6 52 56.80
6	7 1 21.45	22.21	+22 42 6.2	5.1	10.275	−15.05	+4 28.12	15 44.99	1 8.49	6 56 53.36
7	7 5 27.86	28.65	22 35 53.3	52.1	10.259	16.03	4 37.97	15 45.01	1 8.44	7 0 49.91
8	7 9 33.88	34.69	22 29 17.0	15.7	10.242	17.00	4 47.44	15 45.03	1 8.39	7 4 46.47
9	7 13 39.49	40.32	22 22 17.3	15.8	10.225	17.97	4 56.49	15 45.05	1 8.33	7 8 43.03
10	7 17 44.67	45.53	22 14 54.5	52.9	10.207	18.92	5 5.12	15 45.08	1 8.27	7 12 39.59
11	7 21 49.43	50.31	+22 7 8.9	7.2	10.189	−19.87	+5 13.32	15 45.11	1 8.21	7 16 36.14
12	7 25 53.74	54.64	21 58 60.3	58.5	10.170	20.82	5 21.08	15 45.15	1 8.15	7 20 32.70
13	7 29 57.59	58.51	21 50 29.2	27.2	10.151	21.76	5 28.38	15 45.19	1 8.08	7 24 29.26
14	7 34 0.98	1.92	21 41 35.6	33.5	10.131	22.69	5 35.21	15 45.24	1 8.02	7 28 25.81
15	7 38 3.90	4.86	21 32 19.7	17.5	10.111	23.62	5 41.57	15 45.29	1 7.95	7 32 22.37
16	7 42 6.32	7.29	+21 22 41.8	39.5	10.091	−24.53	+5 47.42	15 45.35	1 7.88	7 36 18.93
17	7 46 8.26	9.24	21 12 42.1	39.6	10.070	25.44	5 52.80	15 45.41	1 7.81	7 40 15.48
18	7 50 9.69	10.68	21 2 20.7	18.1	10.049	26.34	5 57.67	15 45.47	1 7.73	7 44 12.04
19	7 54 10.61	11.61	20 51 38.0	35.3	10.027	27.23	6 2.03	15 45.54	1 7.65	7 48 8.60
20	7 58 11.00	12.01	20 40 33.8	31.0	10.005	28.11	6 5.87	15 45.62	1 7.57	7 52 5.15
21	8 2 10.87	11.89	+20 29 8.8	5.9	9.983	−28.97	+6 9.16	15 45.70	1 7.49	7 56 1.71
22	8 6 10.18	11.21	20 17 23.0	19.9	9.960	29.82	6 11.92	15 45.78	1 7.41	7 59 58.26
23	8 10 8.93	9.96	20 5 16.9	13.7	9.937	30.67	6 14.11	15 45.86	1 7.33	8 3 54.82
24	8 14 7.13	8.17	19 52 50.6	47.3	9.913	31.51	6 15.75	15 45.95	1 7.25	8 7 51.38
25	8 18 4.73	5.77	19 40 4.4	1.0	9.889	32.33	6 16.80	15 46.04	1 7.16	8 11 47.93
26	8 22 1.75	2.79	+19 26 58.6	55.1	9.865	−33.14	+6 17.26	15 46.14	1 7.08	8 15 44.49
27	8 25 58.18	59.21	19 13 33.4	29.8	9.839	33.94	6 17.14	15 46.24	1 6.99	8 19 41.04
28	8 29 54.01	55.04	18 59 49.1	45.4	9.814	34.74	6 16.41	15 46.35	1 6.91	8 23 37.60
29	8 33 49.23	50.25	18 45 46.1	42.4	9.788	35.51	6 15.07	15 46.46	1 6.82	8 27 34.16
30	8 37 43.84	44.85	18 31 24.7	20.9	9.762	36.27	6 13.12	15 46.58	1 6.73	8 31 30.71
31	8 41 37.83	38.83	+18 16 45.0	41.2	9.736	−37.02	+6 10.56	15 46.70	1 6.64	8 35 27.27
Aug. 1	8 45 31.21	32.20	18 1 47.5	43.7	9.710	37.77	6 7.38	15 46.82	1 6.55	8 39 23.82
2	8 49 23.96	24.94	17 46 32.4	28.5	9.684	38.49	6 3.55	15 46.95	1 6.47	8 43 20.38
3	8 53 16.08	17.05	17 30 60.0	56.1	9.658	39.20	5 59.13	15 47.08	1 6.38	8 47 16.93
4	8 57 7.58	8.53	17 15 10.6	6.7	9.633	39.90	5 54.08	15 47.21	1 6.30	8 51 13.49
5	9 0 58.47	59.40	+16 59 4.4	0.5	9.607	−40.60	+5 48.42	15 47.35	1 6.21	8 55 10.04
6	9 4 48.75	49.66	16 42 41.8	37.9	9.582	41.27	5 42.13	15 47.49	1 6.12	8 59 6.60
7	9 8 38.42	39.31	16 25 63.2	59.3	9.557	41.94	5 35.25	15 47.63	1 6.03	9 3 3.15
8	9 12 27.49	28.36	16 9 8.6	4.7	9.532	42.60	5 27.75	15 47.78	1 5.95	9 6 59.71
9	9 16 15.97	16.82	15 51 58.5	54.7	9.508	43.23	5 19.66	15 47.93	1 5.86	9 10 56.26
10	9 20 3.86	4.69	+15 34 33.2	29.4	9.484	−43.86	+5 11.00	15 48.09	1 5.78	9 14 52.82
11	9 23 51.18	51.98	15 16 52.8	49.1	9.460	44.48	5 1.76	15 48.26	1 5.70	9 18 49.37
12	9 27 37.93	38.70	14 58 57.8	54.1	9.437	45.09	4 51.96	15 48.43	1 5.62	9 22 45.93
13	9 31 24.13	24.87	14 40 48.3	44.8	9.414	45.69	4 41.62	15 48.60	1 5.54	9 26 42.48
14	9 35 9.81	10.52	14 22 24.6	21.1	9.392	46.27	4 30.74	15 48.77	1 5.46	9 30 39.04
15	9 38 54.96	55.64	+14 3 47.2	43.8	9.371	−46.84	+4 19.34	15 48.94	1 5.38	9 34 35.59
16	9 42 39.60	40.25	+13 44 56.2	52.9	9.350	−47.40	+4 7.42	15 49.12	1 5.31	9 38 32.14

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Aug. 16	9 42 39.60	40.25	+13 44 56.2	52.9	9.350	−47.40	+ 4 7.42	15 49.12	1 5.31	9 38 32.14
17	9 46 23.73	24.35	13 25 51.9	48.7	9.329	47.94	3 55.00	15 49.30	1 5.23	9 42 28.70
18	9 50 7.37	7.96	13 6 34.8	31.7	9.309	48.47	3 42.10	15 49.49	1 5.16	9 46 25.25
19	9 53 50.54	51.09	12 47 5.0	2.1	9.289	48.99	3 28.71	15 49.68	1 5.10	9 50 21.81
20	9 57 33.24	33.75	12 27 23.0	20.3	9.269	49.49	3 14.86	15 49.87	1 5.03	9 54 18.36
21	10 1 15.47	15.94	+12 7 29.1	26.6	9.250	−49.98	+ 3 0.54	15 50.06	1 4.96	9 58 14.92
22	10 4 57.26	57.69	11 47 23.7	21.3	9.231	50.46	2 45.77	15 50.26	1 4.89	10 2 11.47
23	10 8 38.61	39.00	11 27 6.9	4.7	9.213	50.93	2 30.57	15 50.46	1 4.82	10 6 8.02
24	10 12 19.53	19.88	11 6 39.2	37.2	9.195	51.37	2 14.94	15 50.67	1 4.76	10 10 4.58
25	10 16 0.02	0.33	10 45 60.9	59.1	9.178	51.81	1 58.88	15 50.88	1 4.70	10 14 1.13
26	10 19 40.10	40.37	+10 25 12.5	10.9	9.162	−52.23	+ 1 42.41	15 51.09	1 4.64	10 17 57.68
27	10 23 19.80	20.03	10 4 14.2	12.9	9.146	52.63	1 25.55	15 51.31	1 4.58	10 21 54.24
28	10 26 59.10	59.29	9 43 6.3	5.2	9.130	53.02	1 8.31	15 51.53	1 4.52	10 25 50.79
29	10 30 38.04	38.19	9 21 49.1	48.3	9.115	53.40	0 50.69	15 51.75	1 4.47	10 29 47.34
30	10 34 16.63	16.73	9 0 23.1	22.6	9.101	53.76	0 32.71	15 51.97	1 4.42	10 33 43.90
31	10 37 54.86	54.91	+ 8 38 48.5	48.2	9.087	−54.11	+ 0 14.39	15 52.19	1 4.37	10 37 40.45
Sept. 1	10 41 32.76	32.76	8 17 5.7	5.7	9.073	54.45	− 0 4.24	15 52.42	1 4.32	10 41 37.00
2	10 45 10.35	10.31	7 55 15.0	15.3	9.060	54.77	0 23.21	15 52.65	1 4.28	10 45 33.56
3	10 48 47.63	47.54	7 33 16.7	17.3	9.048	55.07	0 42.46	15 52.88	1 4.24	10 49 30.11
4	10 52 24.64	24.50	7 11 11.3	12.2	9.037	55.37	1 2.00	15 53.12	1 4.20	10 53 26.66
5	10 56 1.40	1.21	+ 6 48 58.7	59.9	9.026	−55.66	− 1 21.80	15 53.36	1 4.17	10 57 23.22
6	10 59 37.90	37.66	6 26 39.6	41.1	9.017	55.93	1 41.85	15 53.60	1 4.14	11 1 19.77
7	11 3 14.19	13.90	6 4 14.2	16.0	9.008	56.18	2 2.10	15 53.84	1 4.11	11 5 16.32
8	11 6 50.28	49.94	5 41 42.6	44.7	9.001	56.43	2 22.56	15 54.08	1 4.08	11 9 12.87
9	11 10 26.20	25.80	5 19 5.4	7.9	8.994	56.67	2 43.20	15 54.33	1 4.06	11 13 9.43
10	11 14 1.97	1.51	+ 4 56 22.8	25.6	8.988	−56.88	− 3 3.98	15 54.58	1 4.04	11 17 5.98
11	11 17 37.61	37.10	4 33 35.0	38.2	8.983	57.09	3 24.88	15 54.83	1 4.02	11 21 2.53
12	11 21 13.14	12.58	4 10 42.4	45.9	8.979	57.28	3 45.90	15 55.08	1 4.00	11 24 59.08
13	11 24 48.60	47.99	3 47 45.1	49.0	8.976	57.46	4 6.98	15 55.34	1 3.99	11 28 55.64
14	11 28 24.00	23.34	3 24 43.7	47.9	8.974	57.63	4 28.14	15 55.60	1 3.98	11 32 52.19
15	11 31 59.36	58.65	+ 3 1 38.4	43.1	8.973	−57.79	− 4 49.32	15 55.86	1 3.97	11 36 48.74
16	11 35 34.69	33.92	2 38 29.7	34.6	8.973	57.93	5 10.53	15 56.12	1 3.97	11 40 45.29
17	11 39 10.03	9.21	2 15 17.7	23.0	8.973	58.05	5 31.73	15 56.38	1 3.97	11 44 41.85
18	11 42 45.40	44.52	1 52 2.8	8.4	8.974	58.17	5 52.91	15 56.64	1 3.97	11 48 38.40
19	11 46 20.81	19.88	1 28 45.5	51.5	8.977	58.27	6 14.05	15 56.90	1 3.97	11 52 34.95
20	11 49 56.26	55.27	+ 1 5 26.1	32.4	8.980	−58.34	− 6 35.14	15 57.16	1 3.98	11 56 31.50
21	11 53 31.80	30.76	0 42 4.9	11.6	8.983	58.41	6 56.16	15 57.43	1 3.99	12 0 28.06
22	11 57 7.42	6.33	+ 0 18 42.3	49.3	8.987	58.47	7 17.08	15 57.70	1 4.00	12 4 24.61
23	12 0 43.15	42.01	− 0 4 41.5	34.1	8.992	58.50	7 37.90	15 57.97	1 4.02	12 8 21.16
24	12 4 19.01	17.82	0 27 65.8	58.1	8.997	58.52	7 58.59	15 58.24	1 4.04	12 12 17.71
25	12 7 55.02	53.78	− 0 51 30.7	22.7	9.003	−58.53	− 8 19.12	15 58.51	1 4.06	12 16 14.26
26	12 11 31.19	29.89	1 14 55.5	47.1	9.011	58.53	8 39.50	15 58.78	1 4.09	12 20 10.82
27	12 15 7.54	6.19	1 38 19.8	11.1	9.018	58.50	8 59.70	15 59.05	1 4.12	12 24 7.37
28	12 18 44.08	42.67	2 1 43.5	34.5	9.027	58.46	9 19.70	15 59.33	1 4.15	12 28 3.92
29	12 22 20.85	19.40	2 24 66.0	56.7	9.036	58.41	9 39.49	15 59.61	1 4.19	12 32 0.47
30	12 25 57.84	56.34	− 2 48 27.1	17.5	9.046	−58.34	− 9 59.04	15 59.88	1 4.23	12 35 57.03
31	12 29 35.09	33.54	− 3 11 46.3	36.4	9.057	−58.26	−10 18.35	16 0.16	1 4.27	12 39 53.58

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Oct. 1	12 29 35.09	33.54	− 3 11 46.3	36.4	9.057	−58.26	−10 18.35	16 0.16	1 4.27	12 39 53.58
2	12 33 12.62	11.02	3 34 63.5	53.3	9.070	58.16	10 37.37	16 0.43	1 4.31	12 43 50.13
3	12 36 50.43	48.78	3 58 18.1	7.6	9.082	58.04	10 56.11	16 0.71	1 4.36	12 47 46.68
4	12 40 28.54	26.84	4 21 29.7	18.9	9.095	57.92	11 14.55	16 0.99	1 4.41	12 51 43.24
5	12 44 7.00	5.26	4 44 38.3	27.2	9.109	57.78	11 32.65	16 1.26	1 4.46	12 55 39.79
6	12 47 45.82	44.03	− 5 7 43.3	31.9	9.124	−57.63	−11 50.39	16 1.54	1 4.52	12 59 36.34
7	12 51 25.02	23.18	5 30 44.4	32.8	9.141	57.46	12 7.75	16 1.81	1 4.58	13 3 32.89
8	12 55 4.62	2.73	5 53 41.3	29.5	9.159	57.28	12 24.69	16 2.09	1 4.64	13 7 29.45
9	12 58 44.64	42.71	6 16 33.7	21.7	9.177	57.08	12 41.22	16 2.37	1 4.71	13 11 26.00
10	13 2 25.13	23.15	6 39 21.0	8.8	9.196	56.86	12 57.29	16 2.64	1 4.78	13 15 22.55
11	13 6 6.08	4.06	− 7 1 63.1	50.7	9.216	−56.64	−13 12.88	16 2.92	1 4.85	13 19 19.10
12	13 9 47.55	45.49	7 24 39.6	27.0	9.238	56.40	13 27.97	16 3.19	1 4.93	13 23 15.66
13	13 13 29.53	27.43	7 46 70.1	57.3	9.261	56.13	13 42.54	16 3.47	1 5.00	13 27 12.21
14	13 17 12.06	9.92	8 9 34.3	21.3	9.284	55.86	13 56.58	16 3.74	1 5.08	13 31 8.76
15	13 20 55.14	52.96	8 31 51.7	38.6	9.308	55.58	14 10.05	16 4.02	1 5.16	13 35 5.32
16	13 24 38.81	36.60	− 8 53 62.0	48.8	9.332	−55.27	−14 22.92	16 4.29	1 5.24	13 39 1.87
17	13 28 23.08	20.84	9 15 64.8	51.5	9.357	54.95	14 35.22	16 4.57	1 5.32	13 42 58.42
18	13 32 7.95	5.67	9 37 59.5	46.1	9.383	54.61	14 46.90	16 4.84	1 5.41	13 46 54.98
19	13 35 53.45	51.13	9 59 46.0	32.5	9.409	54.25	14 57.98	16 5.11	1 5.50	13 50 51.53
20	13 39 39.60	37.24	10 21 23.8	10.2	9.436	53.88	15 8.39	16 5.38	1 5.59	13 54 48.08
21	13 43 26.39	23.99	−10 42 52.4	38.8	9.464	−53.48	−15 18.16	16 5.65	1 5.68	13 58 44.64
22	13 47 13.86	11.43	11 3 71.4	57.7	9.493	53.08	15 27.25	16 5.92	1 5.78	14 2 41.19
23	13 50 62.00	59.54	11 25 20.5	6.8	9.522	52.66	15 35.66	16 6.18	1 5.88	14 6 37.74
24	13 54 50.84	48.35	11 46 19.2	5.5	9.551	52.22	15 43.39	16 6.45	1 5.98	14 10 34.30
25	13 58 40.38	37.86	12 6 67.1	53.4	9.580	51.77	15 50.41	16 6.71	1 6.08	14 14 30.85
26	14 2 30.63	28.08	−12 27 43.7	30.1	9.609	−51.29	−15 56.72	16 6.97	1 6.19	14 18 27.40
27	14 6 21.60	19.02	12 47 68.8	55.2	9.639	50.79	16 2.30	16 7.23	1 6.30	14 22 23.96
28	14 10 13.30	10.70	13 8 21.9	8.4	9.670	50.29	16 7.16	16 7.49	1 6.41	14 26 20.51
29	14 14 5.75	3.13	13 28 22.6	9.2	9.701	49.76	16 11.27	16 7.75	1 6.52	14 30 17.07
30	14 17 58.95	56.31	13 47 70.4	57.1	9.733	49.21	16 14.63	16 8.01	1 6.63	14 34 13.62
31	14 21 52.92	50.26	−14 7 44.9	31.7	9.765	−48.65	−16 17.24	16 8.26	1 6.74	14 38 10.17
Nov. 1	14 25 47.65	44.98	14 26 65.8	52.7	9.797	48.07	16 19.07	16 8.51	1 6.85	14 42 6.73
2	14 29 43.16	40.48	14 45 72.7	59.7	9.830	47.48	16 20.12	16 8.75	1 6.96	14 46 3.28
3	14 33 39.46	36.78	15 4 65.2	52.4	9.863	46.88	16 20.38	16 8.99	1 7.08	14 49 59.84
4	14 37 36.55	33.86	15 23 42.8	30.2	9.896	46.25	16 19.85	16 9.23	1 7.20	14 53 56.39
5	14 41 34.46	31.77	−15 41 65.2	52.8	9.930	−45.61	−16 18.51	16 9.47	1 7.32	14 57 52.95
6	14 45 33.19	30.50	15 59 71.9	59.8	9.965	44.95	16 16.34	16 9.71	1 7.44	15 1 49.50
7	14 49 32.76	30.06	16 17 62.7	50.8	10.000	44.27	16 13.34	16 9.95	1 7.56	15 5 46.06
8	14 53 33.16	30.46	16 35 37.1	25.4	10.035	43.58	16 9.50	16 10.18	1 7.68	15 9 42.61
9	14 57 34.42	31.72	16 52 54.8	43.4	10.071	42.88	16 4.80	16 10.41	1 7.80	15 13 39.17
10	15 1 36.53	33.84	−17 9 55.2	43.9	10.107	−42.15	−15 59.25	16 10.64	1 7.92	15 17 35.72
11	15 5 39.51	36.83	17 26 38.0	27.0	10.143	41.41	15 52.82	16 10.87	1 8.04	15 21 32.28
12	15 9 43.36	40.69	17 42 62.9	52.2	10.179	40.66	15 45.54	16 11.09	1 8.16	15 25 28.83
13	15 13 48.09	45.43	17 58 69.4	59.0	10.215	39.88	15 37.38	16 11.31	1 8.28	15 29 25.39
14	15 17 53.68	51.04	18 14 57.1	47.1	10.251	39.09	15 28.35	16 11.52	1 8.40	15 33 21.94
15	15 21 60.14	57.52	−18 30 25.7	15.9	10.287	−38.28	−15 18.47	16 11.73	1 8.51	15 37 18.50
16	15 26 7.45	4.85	−18 45 34.7	25.2	10.323	−37.46	−15 7.71	16 11.94	1 8.63	15 41 15.06

Note.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.18 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Nov. 16	15 26 7.45	4.85	−18 45 34.7	25.2	10.323	−37.46	−15 7.71	16 11.94	1 8.63	15 41 15.06
17	15 30 15.62	13.04	19 0 23.7	14.5	10.358	36.62	14 56.11	16 12.15	1 8.74	15 45 11.61
18	15 34 24.64	22.09	19 14 52.3	43.5	10.393	35.76	14 43.65	16 12.35	1 8.86	15 49 8.17
19	15 38 34.50	31.98	19 28 60.2	51.8	10.428	34.89	14 30.35	16 12.55	1 8.97	15 53 4.72
20	15 42 45.20	42.71	19 42 47.0	38.8	10.462	34.00	14 16.23	16 12.75	1 9.08	15 57 1.28
21	15 46 56.70	54.24	−19 56 12.3	4.5	10.496	−33.09	−14 1.28	16 12.95	1 9.19	16 0 57.84
22	15 51 9.02	6.60	20 9 15.6	8.1	10.529	32.17	13 45.54	16 13.14	1 9.30	16 4 54.39
23	15 55 22.12	19.74	20 21 56.8	49.7	10.562	31.24	13 28.98	16 13.33	1 9.41	16 8 50.95
24	15 59 36.00	33.66	20 34 15.3	8.5	10.594	30.29	13 11.66	16 13.51	1 9.52	16 12 47.50
25	16 3 50.64	48.34	20 46 11.0	4.6	10.625	29.33	12 53.58	16 13.69	1 9.63	16 16 44.06
26	16 8 6.01	3.76	−20 57 43.4	37.4	10.655	−28.36	−12 34.76	16 13.86	1 9.73	16 20 40.62
27	16 12 22.11	19.91	21 8 52.1	46.5	10.684	27.37	12 15.23	16 14.03	1 9.83	16 24 37.17
28	16 16 38.90	36.76	21 19 36.9	31.6	10.713	26.36	11 54.99	16 14.19	1 9.93	16 28 33.73
29	16 20 56.39	54.31	21 29 57.5	52.6	10.742	25.34	11 34.06	16 14.35	1 10.03	16 32 30.29
30	16 25 14.53	12.51	21 39 53.5	49.0	10.770	24.32	11 12.48	16 14.51	1 10.12	16 36 26.84
Dec. 1	16 29 33.31	31.35	−21 49 24.7	20.4	10.796	−23.28	−10 50.26	16 14.66	1 10.21	16 40 23.40
2	16 33 52.71	50.81	21 58 30.8	26.9	10.821	22.22	10 27.42	16 14.81	1 10.29	16 44 19.96
3	16 38 12.72	10.89	22 7 11.4	7.8	10.845	21.16	10 3.95	16 14.96	1 10.37	16 48 16.52
4	16 42 33.31	31.55	22 15 26.5	23.2	10.870	20.09	9 39.92	16 15.11	1 10.44	16 52 13.07
5	16 46 54.47	52.78	22 23 15.6	12.6	10.893	19.00	9 15.33	16 15.25	1 10.52	16 56 9.63
6	16 51 16.16	14.54	−22 30 38.6	35.9	10.915	−17.90	− 8 50.19	16 15.38	1 10.59	17 0 6.19
7	16 55 38.38	36.83	22 37 35.2	32.9	10.936	16.80	8 24.52	16 15.50	1 10.66	17 4 2.75
8	16 59 61.10	59.63	22 44 5.3	3.3	10.957	15.69	7 58.35	16 15.62	1 10.73	17 7 59.30
9	17 4 24.30	22.91	22 50 8.6	6.8	10.976	14.57	7 31.70	16 15.73	1 10.79	17 11 55.86
10	17 8 47.95	46.64	22 55 44.8	43.3	10.994	13.44	7 4.61	16 15.84	1 10.85	17 15 52.42
11	17 13 12.04	10.81	−23 0 54.0	52.7	11.011	−12.31	− 6 37.07	16 15.95	1 10.90	17 19 48.98
12	17 17 36.52	35.37	23 5 35.6	34.5	11.027	11.16	6 9.14	16 16.06	1 10.95	17 23 45.53
13	17 22 1.37	0.31	23 9 49.8	48.9	11.042	10.01	5 40.84	16 16.16	1 11.00	17 27 42.09
14	17 26 26.56	25.58	23 13 36.4	35.6	11.055	8.86	5 12.20	16 16.25	1 11.04	17 31 38.65
15	17 30 52.04	51.15	23 16 55.1	54.5	11.067	7.70	4 43.27	16 16.34	1 11.08	17 35 35.20
16	17 35 17.80	17.00	−23 19 45.9	45.4	11.078	− 6.54	− 4 14.07	16 16.43	1 11.11	17 39 31.76
17	17 39 43.79	43.08	23 22 8.7	8.3	11.087	5.37	3 44.62	16 16.52	1 11.14	17 43 28.32
18	17 44 9.99	9.37	23 24 3.4	3.1	11.095	4.20	3 14.97	16 16.59	1 11.16	17 47 24.88
19	17 48 36.35	35.82	23 25 29.9	29.7	11.101	3.02	2 45.16	16 16.66	1 11.17	17 51 21.44
20	17 53 2.83	2.39	23 26 28.1	28.0	11.106	1.85	2 15.21	16 16.73	1 11.18	17 55 17.99
21	17 57 29.41	29.07	−23 26 58.2	58.2	11.109	− 0.67	− 1 45.18	16 16.79	1 11.19	17 59 14.55
22	18 1 56.05	55.81	23 26 59.8	59.8	11.110	+ 0.51	1 15.09	16 16.84	1 11.19	18 3 11.11
23	18 6 22.69	22.54	23 26 33.3	33.3	11.110	1.69	0 45.00	16 16.89	1 11.19	18 7 7.67
24	18 10 49.30	49.24	23 25 38.4	38.4	11.108	2.87	− 0 14.94	16 16.93	1 11.19	18 11 4.23
25	18 15 15.84	15.87	23 24 15.2	15.2	11.104	4.05	+ 0 15.06	16 16.97	1 11.19	18 15 0.78
26	18 19 42.29	42.41	−23 22 24.0	24.0	11.099	+ 5.23	+ 0 44.95	16 17.01	1 11.18	18 18 57.34
27	18 24 8.60	8.81	23 20 4.5	4.4	11.092	6.40	1 14.71	16 17.05	1 11.17	18 22 53.90
28	18 28 34.72	35.02	23 17 16.9	16.7	11.084	7.57	1 44.29	16 17.08	1 11.14	18 26 50.46
29	18 33 0.63	1.02	23 14 1.4	1.1	11.075	8.73	2 13.65	16 17.10	1 11.11	18 30 47.01
30	18 37 26.29	26.77	23 10 17.9	17.5	11.063	9.89	2 42.77	16 17.12	1 11.08	18 34 43.57
31	18 41 51.68	52.25	−23 6 6.7	6.1	11.051	+11.05	+ 3 11.61	16 17.13	1 11.04	18 38 40.13
32	18 46 16.77	17.43	−23 1 27.8	27.0	11.038	+12.20	+ 3 40.15	16 17.13	1 11.00	18 42 36.69

Note.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.19$ from the sidereal interval.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan. 1	0 11.36	2.492	18 54 57.85	159.81	−20 49 15.7	+406.1	73.11	16 21.4	59 55.3	
2	1 10.31	2.412	19 58 1.11	154.96	−17 23 49.9	613.3	71.96	16 27.5	60 17.8	I. S.
3	2 6.92	2.304	20 58 43.23	148.45	−12 45 56.3	765.8	70.41	16 29.3	60 24.3	I. S.
4	3 0.95	2.202	21 56 50.30	142.36	− 7 19 46.8	854.3	68.96	16 26.9	60 15.5	I. S.
5	3 52.87	2.131	22 52 51.03	138.08	− 1 30 45.7	881.0	67.94	16 21.1	59 54.1	I. S.
6	4 43.56	2.099	23 47 37.01	136.16	+ 4 17 37.4	+852.4	67.50	16 12.8	59 23.8	I. S.
7	5 33.95	2.106	0 42 5.40	136.56	9 44 51.6	776.3	67.62	16 3.2	58 48.3	I. S.
8	6 24.88	2.142	1 37 5.81	138.71	14 33 14.8	659.1	68.17	15 53.0	58 10.9	I. S.
9	7 16.85	2.190	2 33 9.51	141.64	18 27 33.8	507.1	68.88	15 42.9	57 33.9	I. S.
10	8 9.95	2.231	3 30 20.31	144.07	21 15 20.4	328.0	69.43	15 33.3	56 58.5	I. S.
11	9 3.69	2.242	4 28 10.51	144.74	+22 47 54.0	+133.3	69.53	15 24.3	56 25.4	I. S.
12	9 57.21	2.210	5 25 46.72	142.84	23 1 50.9	− 62.7	68.98	15 15.9	55 54.7	I. S.
13	10 49.45	2.137	6 22 6.44	138.45	21 59 54.3	−243.9	67.82	15 8.3	55 26.8	I. N. S.
14	11 39.57	2.037	7 16 18.60	132.39	19 50 17.6	−399.1	66.23	15 1.4	55 1.5	I. S.
15	12 27.14	1.928	8 7 57.22	125.85	16 44 51.6	−522.3	64.52	14 55.4	54 39.5	II. S.
16	13 12.19	1.829	8 57 3.93	119.89	+12 56 48.0	−612.5	62.94	14 50.5	54 21.5	II. S.
17	13 55.11	1.752	9 44 2.54	115.28	8 38 55.8	−672.1	61.73	14 47.0	54 8.7	II. S.
18	14 36.53	1.706	10 29 31.45	112.47	+ 4 2 49.6	−704.2	61.02	14 45.3	54 2.3	II. S.
19	15 17.25	1.693	11 14 17.58	111.73	− 0 41 17.2	−712.4	60.88	14 45.6	54 3.5	II. S.
20	15 58.11	1.719	11 59 12.76	113.25	− 5 24 4.4	−697.7	61.36	14 48.4	54 13.7	II. S.
21	16 40.03	1.782	12 45 11.61	117.06	− 9 56 21.0	−659.5	62.47	14 53.9	54 33.8	II. S.
22	17 23.93	1.883	13 33 9.29	123.13	−14 8 6.3	−594.3	64.15	15 2.2	55 4.4	II. S.
23	18 10.66	2.016	14 23 57.26	131.15	−17 47 31.2	−496.7	66.27	15 13.3	55 45.2	II. S.
24	19 0.87	2.170	15 18 14.81	140.42	−20 40 20.4	−360.5	68.63	15 27.0	56 35.4	II. S.
25	19 54.80	2.320	16 16 15.55	149.47	−22 30 8.7	−181.5	70.84	15 42.5	57 32.5	II. S.
26	20 51.99	2.437	17 17 32.87	156.45	−23 0 27.4	+ 35.4	72.47	15 58.9	58 32.6	II. S.
27	21 51.26	2.491	18 20 55.72	159.72	−21 58 56.7	273.6	73.18	16 14.7	59 30.5	II. N.
28	22 51.00	2.476	19 24 46.20	158.82	−19 22 21.4	505.6	72.91	16 28.1	60 19.9	II. N.
29	23 49.70	2.410	20 27 34.63	154.84	−15 19 22.8	700.9	71.92	16 37.5	60 54.5	
31	0 46.52	2.325	21 28 29.61	149.71	−10 9 33.0	837.1	70.67	16 41.8	61 10.0	
Feb. 1	1 41.36	2.249	22 27 25.51	145.15	− 4 19 3.0	+903.6	69.57	16 40.3	61 4.8	I. S.
2	2 34.69	2.201	23 24 50.61	142.25	+ 1 44 8.0	901.3	68.90	16 33.8	60 40.8	I. S.
3	3 27.25	2.184	0 21 29.25	141.27	7 33 49.7	837.8	68.72	16 23.3	60 2.1	I. S.
4	4 19.76	2.195	1 18 5.22	141.94	12 47 38.3	723.8	68.94	16 10.2	59 14.2	I. S.
5	5 12.74	2.220	2 15 9.07	143.44	17 7 38.1	570.7	69.36	15 56.1	58 22.5	I. S.
6	6 6.31	2.242	3 12 48.64	144.73	+20 20 32.2	+390.4	69.69	15 42.3	57 31.5	I. S.
7	7 0.16	2.241	4 10 45.24	144.70	22 18 0.5	195.7	69.66	15 29.4	56 44.3	I. S.
8	7 53.61	2.207	5 8 17.82	142.65	22 57 2.9	+ 0.5	69.10	15 18.1	56 2.6	I. S.
9	8 45.83	2.139	6 4 36.07	138.55	22 20 5.4	−182.3	68.00	15 8.5	55 27.4	I. S.
10	9 36.10	2.047	6 58 56.71	132.99	20 34 15.1	−342.5	66.50	15 0.6	54 58.4	I. N.
11	10 24.00	1.945	7 50 55.56	126.90	+17 49 53.6	−474.3	64.84	14 54.3	54 35.4	I. N.
12	11 9.53	1.851	8 40 31.18	121.19	14 18 54.9	−575.5	63.27	14 49.6	54 18.0	I. N.
13	11 52.97	1.774	9 28 1.55	116.57	10 13 26.6	−647.0	61.98	14 46.2	54 5.6	I. N. S.
14	12 34.86	1.722	10 13 58.21	113.45	5 45 2.5	−690.5	61.12	14 44.3	53 58.6	II. S.
15	13 15.85	1.699	10 59 1.02	112.11	+ 1 4 27.7	−708.1	60.77	14 43.9	53 57.1	II. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb. 15	13 15.85	1.699	10 59 1.02	112.11	+ 1 4 27.7	−708.1	60.77	14 43.9	53 57.1	II. S.
16	13 56.69	1.709	11 43 54.29	112.68	− 3 38 10.9	−701.0	60.97	14 45.1	54 1.4	II. S.
17	14 38.14	1.751	12 29 24.80	115.21	− 8 13 5.1	−669.3	61.74	14 48.2	54 12.8	II. S.
18	15 20.99	1.826	13 16 19.60	119.69	−12 30 11.3	−611.7	63.03	14 53.3	54 31.8	II. S.
19	16 5.99	1.929	14 5 23.37	125.89	−16 18 36.5	−525.3	64.76	15 0.9	54 59.5	II. S.
20	16 53.75	2.054	14 57 13.16	133.41	−19 26 9.0	−406.7	66.78	15 10.8	55 36.0	II. S.
21	17 44.61	2.185	15 52 10.10	141.31	−21 39 16.3	−253.0	68.82	15 23.2	56 21.6	II. S.
22	18 38.51	2.302	16 50 9.46	148.37	−22 43 56.9	− 65.0	70.57	15 37.7	57 14.9	II. S.
23	19 34.83	2.383	17 50 34.34	153.23	−22 27 50.2	+148.8	71.73	15 53.7	58 13.5	II. S.
24	20 32.50	2.414	18 52 20.72	155.11	−20 43 30.5	372.5	72.12	16 10.0	59 13.4	II. N.
25	21 30.34	2.399	19 54 16.74	154.16	−17 31 34.9	+582.7	71.82	16 25.1	60 8.9	II. N.
26	22 27.41	2.355	20 55 27.03	151.53	−13 2 14.9	755.8	71.11	16 37.3	60 53.5	II. N.
27	23 23.33	2.307	21 55 28.28	148.64	− 7 34 32.3	872.5	70.37	16 44.8	61 21.1	
Mar. 1	0 18.26	2.274	22 54 29.18	146.64	− 1 33 48.2	919.7	69.86	16 46.5	61 27.5	
2	1 12.66	2.265	23 52 59.19	146.10	+ 4 31 40.6	896.0	69.74	16 42.2	61 11.6	
3	2 7.14	2.278	0 51 32.98	146.89	+10 14 6.3	+806.0	69.98	16 32.6	60 36.3	I. S.
4	3 2.08	2.302	1 50 35.44	148.33	15 9 6.7	661.2	70.40	16 19.0	59 46.5	I. S.
5	3 57.56	2.319	2 50 9.99	149.37	18 57 53.9	477.7	70.72	16 3.3	58 48.7	I. S.
6	4 53.19	2.311	3 49 53.04	148.88	21 28 36.9	274.0	70.66	15 47.1	57 49.3	I. S.
7	5 48.19	2.267	4 48 58.87	146.21	22 36 52.6	+ 68.4	70.02	15 31.7	56 52.7	I. S.
8	6 41.69	2.186	5 46 33.94	141.40	+22 25 12.4	−123.4	68.80	15 18.0	56 2.5	I. S.
9	7 32.95	2.083	6 41 54.53	135.17	21 1 24.9	−290.9	67.18	15 6.6	55 20.6	I. N.
10	8 21.61	1.972	7 34 38.62	128.53	18 36 24.2	−429.1	65.40	14 57.7	54 47.7	I. N.
11	9 7.69	1.871	8 24 48.03	122.41	15 22 8.5	−537.2	63.70	14 51.1	54 23.5	I. N.
12	9 51.56	1.789	9 12 43.83	117.46	11 30 22.8	−616.9	62.30	14 46.7	54 7.5	I. N.
13	10 33.77	1.733	9 58 59.55	114.12	+ 7 12 9.1	−669.9	61.31	14 44.3	53 58.7	I. N.
14	11 14.98	1.706	10 44 15.51	112.52	+ 2 37 47.7	−697.7	60.82	14 43.7	53 56.5	I. N. S.
15	11 55.91	1.710	11 29 15.10	112.76	− 2 2 43.4	−700.8	60.86	14 44.7	54 0.0	I. S.
16	12 37.31	1.745	12 14 42.48	114.82	− 6 39 24.8	−678.4	61.44	14 47.1	54 9.0	II. S.
17	13 19.89	1.808	13 1 20.62	118.63	−11 1 50.6	−629.1	62.51	14 51.0	54 23.3	II. S.
18	14 4.30	1.896	13 49 48.77	123.94	−14 58 50.7	−550.9	63.99	14 56.4	54 43.1	II. S.
19	14 51.05	2.002	14 40 38.10	130.29	−18 18 21.9	−441.4	65.73	15 3.4	55 8.8	II. S.
20	15 40.43	2.113	15 34 5.54	136.96	−20 47 41.8	−300.0	67.52	15 12.1	55 40.9	II. S.
21	16 32.37	2.212	16 30 7.01	142.96	−22 14 19.5	−128.6	69.09	15 22.7	56 19.6	II. S.
22	17 26.39	2.284	17 28 13.62	147.25	−22 27 28.9	+ 65.8	70.20	15 34.9	57 4.5	II, S.
23	18 21.67	2.317	18 27 36.27	149.24	−21 20 10.8	+271.3	70.70	15 48.5	57 54.3	II. N.
24	19 17.30	2.314	19 27 19.62	149.05	−18 51 9.3	471.6	70.63	16 2.7	58 46.6	II, N.
25	20 12.55	2.288	20 26 40.27	147.52	−15 5 52.1	649.7	70.20	16 16.6	59 37.8	II. N.
26	21 7.11	2.260	21 25 19.55	145.80	−10 16 31.5	789.4	69.71	16 28.8	60 22.5	II. N.
27	22 1.13	2.245	22 23 25.81	144.94	− 4 41 20.0	876.8	69.42	16 37.7	60 55.2	II. N.
28	22 55.06	2.254	23 21 27.58	145.48	+ 1 16 36.5	+901.7	69.52	16 42.0	61 10.9	II. N.
29	23 49.54	2.289	0 20 1.56	147.55	7 10 57.0	858.5	70.00	16 40.8	61 6.5	
31	0 45.05	2.338	1 19 37.77	150.53	12 34 28.8	748.6	70.74	16 34.1	60 42.0	
Apr. 1	1 41.74	2.383	2 20 24.93	153.23	17 2 17.1	582.2	71.43	16 22.7	60 0.2	I. S.
2	2 39.21	2.400	3 21 59.36	154.23	+20 15 12.3	+377.9	71.74	16 8.1	59 6.5	I. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 2	2 39.21	2.400	3 21 59.36	154.23	+20 15 12.3	+377.9	71.74	16 8.1	59 6.5	I. S.
3	3 36.55	2.370	4 23 25.40	152.42	22 2 40.1	+159.0	71.37	15 52.0	58 7.2	I. S.
4	4 32.54	2.289	5 23 31.01	147.59	22 23 41.0	− 51.0	70.25	15 35.9	57 8.2	I. S.
5	5 26.14	2.173	6 21 12.47	140.60	21 25 23.8	−235.4	68.54	15 21.1	56 13.9	I. N.
6	6 16.75	2.043	7 15 53.49	132.79	19 19 52.6	−386.4	66.56	15 8.5	55 27.6	I. N.
7	7 4.28	1.921	8 7 30.04	125.42	+16 20 47.5	−503.5	64.60	14 58.5	54 50.9	I. N.
8	7 49.12	1.820	8 56 24.14	119.36	12 41 10.6	−589.8	62.93	14 51.4	54 24.7	I. N.
9	8 31.89	1.749	9 43 13.90	115.11	8 32 34.6	−649.0	61.70	14 46.9	54 8.3	I. N.
10	9 13.36	1.712	10 28 45.20	112.85	+ 4 5 10.0	−684.2	61.01	14 45.1	54 1.4	I. N.
11	9 54.33	1.708	11 13 46.67	112.63	− 0 31 38.7	−696.1	60.88	14 45.4	54 2.8	I. N.
12	10 35.60	1.737	11 59 6.80	114.38	− 5 8 30.0	−684.1	61.31	14 47.8	54 11.4	I. N.
13	11 17.96	1.797	12 45 31.82	117.99	− 9 35 24.5	−645.9	62.27	14 51.7	54 25.9	I. N. S.
14	12 2.09	1.884	13 33 43.29	123.19	−13 41 14.8	−578.2	63.65	14 57.0	54 45.2	I. II. S.
15	12 48.52	1.988	14 24 13.44	129.45	−17 13 37.2	−478.1	65.32	15 3.3	55 8.5	II. S.
16	13 37.54	2.096	15 17 18.79	135.96	−19 59 14.4	−344.4	67.04	15 10.6	55 35.3	II. S.
17	14 29.02	2.191	16 12 53.11	141.66	−21 45 1.8	−179.8	68.54	15 18.8	56 5.3	II. S.
18	15 22.45	2.255	17 10 23.95	145.51	−22 19 58.5	+ 8.0	69.57	15 27.8	56 38.3	II. S.
19	16 16.93	2.278	18 8 58.23	146.91	−21 37 17.6	205.9	69.98	15 37.6	57 14.3	II. N.
20	17 11.49	2.264	19 7 37.52	146.03	−19 35 57.8	398.6	69.81	15 48.0	57 52.5	II. N.
21	18 5.40	2.226	20 5 37.17	143.80	−16 21 5.9	571.4	69.27	15 58.7	58 31.8	II. N.
22	18 58.34	2.187	21 2 39.20	141.44	−12 3 8.5	+712.2	68.66	16 9.1	59 10.2	II. N.
23	19 50.51	2.164	21 58 54.55	140.07	− 6 56 42.7	812.2	68.28	16 18.5	59 44.8	II. N.
24	20 42.47	2.170	22 54 56.76	140.44	− 1 19 50.5	863.2	68.31	16 25.9	60 11.7	II. N.
25	21 34.95	2.209	23 51 31.28	142.76	+ 4 26 24.6	858.0	68.83	16 30.1	60 27.3	II. N.
26	22 28.72	2.275	0 49 22.88	146.75	9 58 26.9	791.6	69.77	16 30.4	60 28.2	II. N.
27	23 24.26	2.353	1 49 0.77	151.41	+14 51 30.4	+663.8	70.88	16 26.2	60 12.8	
29	0 21.53	2.415	2 50 23.00	155.14	18 42 21.8	483.0	71.79	16 17.8	59 41.9	
30	1 19.82	2.433	3 52 46.42	156.23	21 13 16.0	267.9	72.08	16 5.9	58 58.5	I. S.
May 1	2 17.82	2.390	4 54 52.40	153.61	22 15 37.4	+ 44.7	71.50	15 52.0	58 7.3	I. S.
2	3 14.05	2.288	5 55 11.93	147.53	21 51 21.3	−161.5	70.09	15 37.3	57 13.3	I. N.
3	4 7.38	2.152	6 52 36.88	139.36	+20 10 52.2	−334.5	68.11	15 23.1	56 21.3	I. N.
4	4 57.31	2.010	7 46 37.88	130.80	17 28 57.1	−468.6	65.96	15 10.6	55 35.4	I. N.
5	5 44.00	1.885	8 37 23.34	123.23	14 0 51.2	−566.3	63.99	15 0.5	54 58.1	I. N.
6	6 28.01	1.789	9 25 27.69	117.46	10 0 9.0	−632.7	62.43	14 53.1	54 30.9	I. N.
7	7 10.14	1.729	10 11 39.10	113.87	5 38 12.0	−673.2	61.41	14 48.6	54 14.6	I. N.
8	7 51.29	1.707	10 56 51.28	112.54	+ 1 4 37.2	−691.1	61.00	14 47.1	54 8.9	I. N.
9	8 32.36	1.722	11 41 58.92	113.47	− 3 31 45.4	−687.0	61.19	14 48.3	54 13.2	I. N.
10	9 14.24	1.774	12 27 55.28	116.58	− 8 1 55.5	−659.6	61.99	14 51.8	54 26.3	I. N.
11	9 57.76	1.857	13 15 29.79	121.60	−12 15 46.6	−604.8	63.29	14 57.4	54 46.7	I. N.
12	10 43.59	1.965	14 5 23.88	128.10	−16 1 30.6	−518.2	64.96	15 4.4	55 12.6	I. N.
13	11 32.18	2.084	14 58 4.01	135.27	−19 5 38.0	−396.3	66.79	15 12.5	55 42.2	I. S.
14	12 23.58	2.195	15 53 32.60	141.92	−21 13 49.5	−239.0	68.47	15 21.1	56 13.8	II. S.
15	13 17.29	2.274	16 51 20.69	146.68	−22 13 1.0	− 53.0	69.69	15 29.8	56 45.8	II. S.
16	14 12.35	2.306	17 50 29.99	148.58	−21 54 13.6	+148.0	70.20	15 38.3	57 17.1	II. N. S.
17	15 7.57	2.288	18 49 48.57	147.52	−20 15 2.1	+345.8	70.01	15 46.4	57 46.8	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
May 17	15 7.57	2.288	18 49 48.57	147.52	−20 15 2.1	+345.8	70.01	15 46.4	57 46.8	II. N.
18	16 1.91	2.237	19 48 14.56	144.41	−17 20 21.1	522.9	69.30	15 54.0	58 14.6	II. N.
19	16 54.84	2.175	20 45 15.53	140.69	−13 21 11.7	666.6	68.41	16 0.9	58 39.9	II. N.
20	17 46.39	2.125	21 40 53.65	137.72	− 8 32 31.7	769.6	67.68	16 7.0	59 2.4	II. N.
21	18 37.07	2.104	22 35 39.74	136.47	− 3 11 29.6	827.9	67.36	16 12.0	59 20.8	II. N.
22	19 27.70	2.121	23 30 22.12	137.45	+ 2 23 24.4	+838.4	67.58	16 15.6	59 33.8	II. N.
23	20 19.16	2.173	0 25 54.76	140.61	7 52 21.7	797.6	68.33	16 17.1	59 39.6	II. N.
24	21 12.24	2.253	1 23 4.51	145.39	12 54 18.5	703.1	69.46	16 16.2	59 36.3	II. N.
25	22 7.34	2.338	2 22 16.54	150.55	17 7 44.2	555.7	70.68	16 12.5	59 22.5	II. N.
26	23 4.29	2.401	3 23 19.58	154.31	20 12 59.8	364.4	71.56	16 5.8	58 58.1	
28	0 2.18	2.412	4 25 18.74	154.97	+21 55 54.2	+147.9	71.71	15 56.6	58 24.1	
29	0 59.55	2.358	5 26 46.80	151.70	22 11 12.5	− 69.2	70.93	15 45.4	57 42.9	
30	1 54.90	2.248	6 26 13.72	145.08	21 3 38.4	−263.3	69.35	15 33.2	56 58.3	I. N.
31	2 47.21	2.109	7 22 37.33	136.73	18 45 34.9	−420.3	67.31	15 21.1	56 13.8	I. N.
June 1	3 36.13	1.970	8 15 37.06	128.36	15 32 52.4	−536.7	65.21	15 10.0	55 33.0	I. N.
2	4 21.93	1.852	9 5 29.01	121.25	+11 41 10.6	−616.2	63.38	15 0.7	54 58.9	I. N.
3	5 5.26	1.766	9 52 52.97	116.11	7 24 2.1	−664.7	62.03	14 53.8	54 33.5	I. N.
4	5 47.00	1.719	10 38 40.65	113.27	+ 2 52 35.2	−688.5	61.26	14 49.8	54 18.4	I. N.
5	6 28.08	1.711	11 23 48.35	112.79	− 1 43 49.1	−690.0	61.12	14 48.5	54 14.2	I. N.
6	7 9.43	1.742	12 9 13.16	114.68	− 6 16 35.5	−670.1	61.62	14 50.3	54 20.8	I. N.
7	7 52.00	1.811	12 55 50.75	118.81	−10 36 49.1	−626.7	62.70	14 54.9	54 37.7	I. N.
8	8 36.63	1.913	13 44 32.20	124.93	−14 34 14.0	−555.2	64.29	15 2.0	55 3.6	I. N.
9	9 23.99	2.037	14 35 58.42	132.41	−17 56 33.9	−450.5	66.18	15 11.0	55 36.6	I. N.
10	10 14.45	2.167	15 30 30.79	140.22	−20 29 38.2	−308.6	68.12	15 21.2	56 14.2	I. N.
11	11 7.85	2.277	16 27 59.89	146.87	−21 58 41.6	−131.3	69.73	15 32.0	56 53.7	I. N.
12	12 3.41	2.344	17 27 39.36	150.87	−22 11 13.6	+ 71.5	70.70	15 42.5	57 32.3	I. N. S.
13	12 59.88	2.352	18 28 13.44	151.38	−21 0 34.3	281.1	70.84	15 51.9	58 7.0	I. II. N. S.
14	13 55.91	2.310	19 28 20.84	148.81	−18 28 26.1	475.4	70.25	16 0.0	58 35.8	II. N.
15	14 50.51	2.238	20 27 2.50	144.52	−14 44 53.3	635.7	69.24	16 5.7	58 57.6	II. N.
16	15 43.34	2.166	21 23 57.29	140.16	−10 5 56.9	751.0	68.21	16 9.6	59 11.9	II. N.
17	16 34.64	2.115	22 19 20.73	137.09	− 4 50 35.1	+817.5	67.48	16 11.6	59 19.3	II. N.
18	17 25.11	2.097	23 13 53.75	136.04	+ 0 41 29.3	834.7	67.24	16 11.8	59 20.2	II. N.
19	18 15.63	2.118	0 8 29.49	137.30	6 10 44.1	803.5	67.57	16 10.6	59 15.7	II. N.
20	19 7.06	2.173	1 4 0.71	140.58	11 17 53.2	724.4	68.38	16 8.0	59 5.9	II. N.
21	20 0.09	2.248	2 1 7.28	145.07	15 44 0.2	598.7	69.45	16 3.9	58 51.0	II. N.
22	20 54.92	2.319	3 0 2.88	149.39	+19 11 13.0	+431.1	70.46	15 58.4	58 30.9	II. N.
23	21 51.17	2.361	4 0 23.89	151.91	21 24 42.0	232.5	71.01	15 51.5	58 5.6	II. N.
24	22 47.83	2.350	5 1 9.16	151.26	22 15 32.7	+ 21.4	70.81	15 43.4	57 35.6	II. N.
25	23 43.52	2.282	6 0 56.39	147.13	21 43 3.6	−180.5	69.78	15 34.2	57 1.9	
27	0 37.00	2.170	6 58 30.48	140.40	19 54 49.2	−354.9	68.10	15 24.4	56 26.0	
28	1 27.52	2.040	7 53 6.44	132.56	+17 4 10.3	−491.7	66.14	15 14.7	55 50.3	I. N.
29	2 14.94	1.915	8 44 36.28	125.09	13 26 41.5	−589.4	64.24	15 5.7	55 17.2	I. N.
30	2 59.64	1.814	9 33 22.04	119.02	9 17 22.0	−651.9	62.67	14 58.0	54 48.9	I. N.
July 1	3 42.29	1.746	10 20 4.50	114.88	4 49 10.7	−684.6	61.60	14 52.2	54 27.8	I. N.
2	4 23.73	1.714	11 5 34.03	112.95	+ 0 12 57.6	−692.7	61.11	14 48.9	54 15.4	I. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 2	4 23.73	1.714	11 5 34.03	112.95	+ 0 12 57.6	−692.7	61.11	14 48.9	54 15.4	I. N.
3	5 4.85	1.720	11 50 44.88	113.34	− 4 22 0.3	−678.6	61.26	14 48.2	54 13.1	I. N.
4	5 46.59	1.764	12 36 32.38	116.01	− 8 47 5.1	−643.0	62.01	14 50.6	54 21.6	I. N.
5	6 29.83	1.845	13 23 50.39	120.84	−12 53 14.2	−583.5	63.32	14 55.8	54 40.9	I. N.
6	7 15.38	1.956	14 13 27.85	127.55	−16 30 2.3	−495.4	65.07	15 3.9	55 10.6	I. N.
7	8 3.88	2.087	15 6 2.08	135.42	−19 25 9.0	−374.2	67.07	15 14.4	55 49.1	I. N.
8	8 55.56	2.218	16 1 48.33	143.31	−21 24 28.8	−216.4	69.00	15 26.7	56 34.3	I. N.
9	9 50.15	2.324	17 0 28.81	149.66	−22 13 50.9	− 25.5	70.51	15 39.9	57 22.8	I. N.
10	10 46.71	2.380	18 1 8.71	153.07	−21 42 6.6	+186.1	71.28	15 52.9	58 10.7	I. N. S.
11	11 43.94	2.379	19 2 28.29	152.97	−19 44 57.2	397.6	71.24	16 4.7	58 53.8	I. N.
12	12 40.53	2.331	20 3 9.29	150.06	−16 27 17.0	+584.8	70.53	16 14.0	59 28.0	II. N.
13	13 35.63	2.260	21 2 21.19	145.84	−12 2 50.8	728.9	69.52	16 20.0	59 50.3	II. N.
14	14 29.06	2.195	21 59 52.18	141.90	− 6 51 25.3	818.8	68.58	16 22.7	59 59.8	II. N.
15	15 21.17	2.153	22 56 4.00	139.39	− 1 15 25.0	851.9	68.00	16 21.8	59 56.7	II. N.
16	16 12.67	2.144	23 51 38.78	138.86	+ 4 22 41.6	829.9	67.92	16 18.1	59 43.1	II. N.
17	17 4.35	2.168	0 47 24.96	140.30	+ 9 41 47.5	+757.6	68.32	16 12.2	59 21.6	II. N.
18	17 56.92	2.216	1 44 4.38	143.16	14 22 37.2	639.6	69.05	16 5.0	58 54.8	II. N.
19	18 50.76	2.270	2 42 0.17	146.45	18 8 12.2	482.6	69.85	15 56.7	58 24.7	II. N.
20	19 45.78	2.310	3 41 6.60	148.81	20 44 43.8	296.2	70.39	15 48.2	57 53.2	II. N.
21	20 41.33	2.313	4 40 45.50	148.98	22 3 8.6	+ 94.7	70.37	15 39.4	57 21.1	II. N.
22	21 36.39	2.268	5 39 54.72	146.30	+22 0 46.1	−104.7	69.65	15 30.7	56 49.2	II. N.
23	22 29.86	2.182	6 37 27.88	141.10	20 41 55.6	−285.2	68.30	15 22.2	56 17.7	II. N.
24	23 20.90	2.070	7 32 35.46	134.39	18 16 46.1	−434.8	66.56	15 13.8	55 47.2	
26	0 9.18	1.955	8 24 56.71	127.45	14 58 51.2	−548.6	64.74	15 6.0	55 18.5	
27	0 54.82	1.852	9 14 39.00	121.28	11 2 39.3	−626.7	63.12	14 59.0	54 52.7	
28	1 38.28	1.775	10 2 10.47	116.63	+ 6 41 47.7	−672.5	61.90	14 53.1	54 31.1	I. N.
29	2 20.24	1.728	10 48 11.59	113.80	+ 2 8 18.6	−690.5	61.17	14 48.8	54 15.2	I. N.
30	3 1.48	1.714	11 33 29.08	112.99	− 2 27 21.1	−683.9	61.01	14 46.5	54 6.8	I. N.
31	3 42.81	1.736	12 18 52.24	114.28	− 6 55 51.5	−654.8	61.43	14 46.5	54 6.7	I. N.
Aug. 1	4 25.06	1.791	13 5 10.73	117.59	−11 8 15.7	−603.3	62.39	14 49.2	54 16.5	I. N.
2	5 9.01	1.877	13 53 12.04	122.81	−14 55 12.1	−527.1	63.83	14 54.6	54 36.6	I. N.
3	5 55.37	1.989	14 43 37.50	129.53	−18 6 10.6	−422.8	65.61	15 3.0	55 7.3	I. N.
4	6 44.59	2.113	15 36 55.41	137.02	−20 29 13.9	−287.0	67.53	15 14.1	55 48.2	I. N.
5	7 36.78	2.233	16 33 11.83	144.19	−21 51 23.5	−118.6	69.30	15 27.6	56 37.5	I. N.
6	8 31.53	2.324	17 32 2.73	149.67	−22 0 22.1	+ 77.5	70.59	15 42.5	57 32.5	I. N.
7	9 27.97	2.370	18 32 34.55	152.47	−20 47 28.8	+287.8	71.20	15 57.9	58 29.0	I. N.
8	10 24.93	2.369	19 33 38.02	152.37	−18 10 51.8	492.3	71.12	16 12.4	59 22.2	I. N. S.
9	11 21.39	2.332	20 34 11.32	150.15	−14 17 29.7	667.9	70.54	16 24.3	60 6.0	I. S.
10	12 16.76	2.282	21 33 39.51	147.18	− 9 22 54.3	795.7	69.80	16 32.4	60 35.8	I. N.
11	13 11.02	2.242	22 32 0.26	144.73	− 3 48 54.4	863.7	69.21	16 35.8	60 48.3	II. N.
12	14 4.54	2.223	23 29 37.07	143.62	+ 1 59 32.2	+867.9	68.98	16 34.4	60 43.0	II. N.
13	14 57.94	2.231	0 27 6.24	144.08	7 37 13.3	810.8	69.15	16 28.5	60 21.3	II. N.
14	15 51.79	2.260	1 25 2.87	145.80	12 40 56.6	699.6	69.63	16 19.3	59 47.7	II. N.
15	16 46.45	2.295	2 23 47.91	147.94	16 51 2.0	544.6	70.20	16 8.1	59 6.3	II. N.
16	17 41.86	2.319	3 23 18.20	149.36	+19 52 31.2	+359.0	70.57	15 55.9	58 21.6	II. N.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug. 16	17 41.86	2.319	3 23 18.20	149.36	+19 52 31.2	+359.0	70.57	15 55.9	58 21.6	II. N.
17	18 37.51	2.313	4 23 2.97	148.99	21 36 10.4	+158.2	70.47	15 43.7	57 37.0	II. N.
18	19 32.54	2.269	5 22 10.52	146.23	21 59 17.1	− 41.0	69.75	15 32.3	56 54.9	II. N.
19	20 26.02	2.185	6 19 44.43	141.29	21 5 35.3	−223.6	68.46	15 21.9	56 16.7	II. N. S.
20	21 17.22	2.080	7 15 1.24	134.98	19 4 0.8	−379.1	66.79	15 12.7	55 42.9	II. S.
21	22 5.81	1.970	8 7 41.15	128.38	+16 6 38.8	−502.1	65.02	15 4.7	55 13.6	II. S.
22	22 51.86	1.871	8 57 48.57	122.41	12 26 45.1	−591.9	63.39	14 58.0	54 48.8	II. S.
23	23 35.77	1.792	9 45 46.68	117.68	8 17 19.6	−650.3	62.09	14 52.4	54 28.5	
25	0 18.10	1.740	10 32 10.27	114.57	+ 3 50 25.1	−679.8	61.23	14 48.2	54 12.8	
26	0 59.55	1.718	11 17 40.16	113.23	− 0 43 1.5	−683.2	60.88	14 45.4	54 2.5	
27	1 40.81	1.726	12 2 59.64	113.70	− 5 12 57.5	−662.5	61.06	14 44.2	53 58.2	I. N.
28	2 22.63	1.763	12 48 52.05	115.96	− 9 29 51.9	−618.2	61.74	14 44.9	54 0.7	I. N.
29	3 5.69	1.829	13 35 58.96	119.88	−13 24 17.8	−549.9	62.87	14 47.8	54 11.4	I. N.
30	3 50.59	1.917	14 24 57.24	125.18	−16 46 25.2	−456.3	64.35	14 53.1	54 31.1	I. N.
31	4 37.81	2.020	15 16 14.93	131.39	−19 25 42.4	−335.5	66.03	15 1.1	55 0.4	I. N.
Sept. 1	5 27.57	2.126	16 10 5.19	137.75	−21 11 5.8	−186.8	67.68	15 11.8	55 39.5	I. N.
2	6 19.74	2.218	17 6 20.62	143.31	−21 51 43.1	− 12.4	69.08	15 24.9	56 27.9	I. N.
3	7 13.83	2.284	18 4 31.36	147.25	−21 18 32.2	+180.5	70.03	15 40.1	57 23.7	I. N. S.
4	8 9.07	2.314	19 3 51.23	149.06	−19 26 30.3	379.2	70.42	15 56.4	58 23.6	I. S.
5	9 4.65	2.313	20 3 31.56	149.04	−16 16 40.7	566.4	70.34	16 12.6	59 23.0	I. S.
6	9 59.98	2.296	21 2 57.15	148.01	−11 57 26.6	+723.2	70.03	16 27.0	60 16.0	I. S.
7	10 54.87	2.279	22 1 56.08	146.99	− 6 44 31.0	832.2	69.73	16 38.0	60 56.1	I. S.
8	11 49.50	2.277	23 0 39.58	146.84	− 0 59 47.8	880.5	69.68	16 44.0	61 18.2	I. N.
9	12 44.32	2.295	23 59 34.00	147.92	+ 4 50 45.8	860.9	69.95	16 44.2	61 19.0	II. N.
10	13 39.79	2.330	0 59 7.79	150.02	10 19 59.2	774.7	70.50	16 38.8	60 59.1	II. N.
11	14 36.18	2.369	1 59 37.44	152.39	+15 2 35.4	+629.9	71.13	16 28.6	60 21.8	II. N.
12	15 33.38	2.393	3 0 55.12	153.82	18 38 13.1	442.8	71.54	16 15.3	59 32.7	II. N.
13	16 30.76	2.382	4 2 24.00	153.16	20 53 52.5	233.7	71.44	16 0.3	58 37.6	II. N.
14	17 27.35	2.327	5 3 5.54	149.84	21 45 7.8	+ 24.2	70.66	15 45.1	57 42.0	II. N.
15	18 22.13	2.233	6 1 57.79	144.19	21 15 35.7	−167.8	69.26	15 30.9	56 49.8	II. N. S.
16	19 14.34	2.116	6 58 15.17	137.15	+19 34 48.9	−330.7	67.45	15 18.3	56 3.6	II. S.
17	20 3.66	1.995	7 51 39.05	129.90	16 55 25.7	−460.4	65.54	15 7.7	55 24.7	II. S.
18	20 50.22	1.888	8 42 17.10	123.46	13 30 46.9	−557.4	63.77	14 59.2	54 53.4	II. S.
19	21 34.47	1.804	9 30 35.83	118.38	9 33 33.9	−623.9	62.33	14 52.6	54 29.3	II. S.
20	22 17.02	1.747	10 17 12.50	114.98	5 15 21.3	−662.8	61.34	14 47.9	54 12.0	II. S.
21	22 58.58	1.721	11 2 49.04	113.38	+ 0 46 44.2	−676.2	60.86	14 44.9	54 0.9	
22	23 39.84	1.723	11 48 8.26	113.53	− 3 42 20.1	−665.1	60.88	14 43.4	53 55.5	
24	0 21.51	1.754	12 33 51.68	115.37	− 8 2 8.7	−629.8	61.39	14 43.5	53 55.8	
25	1 4.21	1.809	13 20 37.51	118.69	−12 2 52.8	−569.7	62.33	14 45.2	54 1.8	I. N.
26	1 48.49	1.884	14 8 58.33	123.21	−15 34 26.5	−483.8	63.60	14 48.5	54 14.1	I. N.
27	2 34.75	1.971	14 59 17.53	128.45	−18 26 24.5	−371.8	65.04	14 53.7	54 33.2	I. N.
28	3 23.13	2.060	15 51 45.14	133.79	−20 28 21.8	−234.0	66.50	15 1.0	54 59.9	I. N.
29	4 13.54	2.138	16 46 14.29	138.47	−21 30 35.4	− 73.8	67.75	15 10.5	55 34.7	I. N.
30	5 5.56	2.194	17 42 21.01	141.84	−21 25 10.0	+103.0	68.64	15 22.2	56 17.7	I. N.
Oct. 1	5 58.62	2.223	18 39 29.56	143.63	−20 7 17.9	+286.7	69.09	15 35.8	57 7.9	I. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Oct. 1	5 58.62	2.223	18 39 29.56	143.63	−20 7 17.9	+286.7	69.09	15 35.8	57 7.9	I. S.
2	6 52.09	2.230	19 37 3.41	144.02	−17 36 29.3	465.5	69.18	15 51.0	58 3.5	I. S.
3	7 45.56	2.225	20 34 37.03	143.73	−13 57 15.4	626.3	69.06	16 6.7	59 1.3	I. S.
4	8 38.93	2.223	21 32 4.11	143.64	− 9 19 28.5	755.9	68.97	16 21.7	59 56.4	I. S.
5	9 32.41	2.237	22 29 38.66	144.46	− 3 58 29.9	840.3	69.11	16 34.3	60 42.6	I. S.
6	10 26.51	2.275	23 27 49.83	146.71	+ 1 45 5.4	+867.1	69.61	16 42.8	61 14.0	I. S.
7	11 21.78	2.334	0 27 11.62	150.29	7 26 14.1	827.0	70.46	16 46.0	61 25.7	I. N.
8	12 18.64	2.404	1 28 8.99	154.49	12 37 31.0	718.1	71.48	16 43.2	61 15.5	II. N.
9	13 17.08	2.462	2 30 41.74	157.97	16 52 36.8	548.5	72.35	16 34.9	60 44.7	II. N.
10	14 16.49	2.481	3 34 12.85	159.10	19 50 47.7	337.7	72.68	16 22.0	59 57.5	II. N.
11	15 15.69	2.442	4 37 30.71	156.76	+21 20 51.7	+112.8	72.19	16 6.4	59 0.3	II. N.
12	16 13.24	2.346	5 39 9.98	151.01	21 22 40.5	− 99.7	70.86	15 49.9	57 59.6	II. N.
13	17 8.00	2.213	6 38 1.18	143.02	20 5 17.5	−281.1	68.93	15 33.9	57 0.9	II. S.
14	17 59.40	2.070	7 33 29.83	134.39	17 42 54.0	−424.3	66.76	15 19.6	56 8.1	II. S.
15	18 47.46	1.939	8 25 38.20	126.50	14 30 51.6	−529.9	64.68	15 7.4	55 23.6	II. S.
16	19 32.67	1.834	9 14 54.96	120.20	+10 43 19.4	−602.7	62.96	14 57.9	54 48.7	II. S.
17	20 15.75	1.761	10 2 3.19	115.84	6 32 26.0	−647.4	61.71	14 51.0	54 23.2	II. S.
18	20 57.50	1.723	10 47 51.42	113.53	+ 2 8 39.3	−667.6	61.01	14 46.5	54 6.8	II. S.
19	21 38.73	1.718	11 33 8.69	113.23	− 2 18 35.8	−664.8	60.86	14 44.3	53 58.7	II. S.
20	22 20.22	1.744	12 18 41.32	114.79	− 6 40 8.0	−638.9	61.23	14 44.0	53 57.7	II. S.
21	23 2.66	1.797	13 5 11.33	117.96	−10 46 27.5	−588.5	62.06	14 45.5	54 2.9	
22	23 46.64	1.871	13 53 13.73	122.42	−14 27 24.9	−511.7	63.24	14 48.4	54 13.7	
24	0 32.55	1.957	14 43 12.74	127.58	−17 32 11.0	−407.4	64.62	14 52.6	54 29.3	
25	1 20.55	2.042	15 35 17.31	132.73	−19 49 46.8	−276.2	66.00	14 58.2	54 49.8	I. N.
26	2 10.47	2.114	16 29 17.33	137.06	−21 10 2.6	−121.7	67.17	15 5.1	55 15.1	I. N.
27	3 1.84	2.161	17 24 43.96	139.87	−21 25 0.6	+ 48.7	67.95	15 13.4	55 45.5	I. N.
28	3 53.96	2.178	18 20 56.48	140.88	−20 30 15.8	225.0	68.27	15 23.1	56 21.1	I. S.
29	4 46.17	2.170	19 17 14.54	140.44	−18 25 44.8	395.7	68.21	15 34.2	57 2.0	I. S.
30	5 38.03	2.151	20 13 11.18	139.26	−15 15 49.2	550.5	67.94	15 46.5	57 47.1	I. S.
31	6 29.45	2.136	21 8 40.92	138.34	−11 8 48.4	679.7	67.70	15 59.5	58 34.8	I. S.
Nov. 1	7 20.70	2.139	22 4 0.91	138.57	− 6 16 31.8	+775.3	67.72	16 12.3	59 22.0	I. S.
2	8 12.37	2.172	22 59 46.51	140.55	− 0 54 18.5	827.8	68.17	16 23.9	60 4.6	I. S.
3	9 5.22	2.237	23 56 42.83	144.46	+ 4 38 44.4	827.7	69.08	16 32.9	60 37.7	I. S.
4	9 59.97	2.329	0 55 33.37	149.95	9 59 39.9	766.0	70.37	16 38.0	60 56.2	I. S.
5	10 57.06	2.427	1 56 44.24	155.89	14 42 50.3	639.1	71.77	16 38.0	60 56.4	I. S.
6	11 56.31	2.504	3 0 5.89	160.50	+18 23 4.6	+453.7	72.86	16 32.8	60 37.3	II. N.
7	12 56.80	2.525	4 4 41.42	161.76	20 40 40.1	+230.5	73.19	16 22.9	60 0.7	II. N.
8	13 56.91	2.472	5 8 54.45	158.57	21 26 21.0	− 0.5	72.48	16 9.3	59 10.8	II. N.
9	14 54.92	2.354	6 11 1.25	151.45	20 43 13.1	−209.6	70.84	15 53.7	58 13.7	II. S.
10	15 49.60	2.200	7 9 47.60	142.22	18 44 3.8	−378.9	68.63	15 37.8	57 15.2	II. S.
11	16 40.50	2.044	8 4 46.52	132.81	+15 46 7.7	−503.7	66.29	15 22.9	56 20.5	II. S.
12	17 27.86	1.908	8 56 12.84	124.68	12 6 32.8	−588.1	64.20	15 10.0	55 33.0	II. S.
13	18 12.38	1.807	9 44 47.43	118.58	7 59 59.1	−639.6	62.56	14 59.6	54 55.0	II. S.
14	18 54.91	1.744	10 31 23.03	114.77	+ 3 38 19.3	−664.5	61.50	14 52.2	54 27.5	II. S.
15	19 36.39	1.719	11 16 55.34	113.30	− 0 48 40.5	−666.8	61.04	14 47.6	54 10.6	II. S.

AT TRANSIT OF MOON'S CENTRE OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Centre.	Diff. for 1 Hour of Long.	Geocentric Declination of Centre.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Nov. 15	19 36.39	1.719	11 16 55.34	113.30	− 0 48 40.5	−666.8	61.04	14 47.6	54 10.6	II. S.
16	20 17.73	1.731	12 2 18.62	114.01	− 5 12 18.7	−647.8	61.17	14 45.8	54 4.0	II. S.
17	20 59.74	1.776	12 48 23.21	116.70	− 9 23 57.8	−606.6	61.84	14 46.4	54 6.5	II. S.
18	21 43.18	1.848	13 35 53.04	121.03	−13 14 18.7	−540.8	62.95	14 49.3	54 16.8	II. S.
19	22 28.59	1.939	14 25 21.86	126.50	−16 32 53.9	−447.4	64.35	14 53.8	54 33.6	II. S.
20	23 16.28	2.035	15 17 7.66	132.30	−19 8 21.2	−325.1	65.82	14 59.7	54 55.2	
22	0 6.19	2.120	16 11 6.68	137.42	−20 49 17.2	−175.5	67.13	15 6.6	55 20.4	
23	0 57.84	2.178	17 6 50.65	140.89	−21 25 59.9	− 5.5	68.03	15 14.1	55 48.0	I. N.
24	1 50.43	2.199	18 3 31.56	142.13	−20 52 28.7	+173.4	68.39	15 22.1	56 17.3	I. S.
25	2 43.08	2.183	19 0 15.45	141.21	−19 7 53.9	347.6	68.23	15 30.4	56 47.9	I. S.
26	3 35.06	2.146	19 56 19.69	138.99	−16 16 50.5	+503.9	67.73	15 39.0	57 19.6	I. S.
27	4 26.08	2.106	20 51 25.55	136.56	−12 28 22.2	633.4	67.17	15 47.9	57 52.1	I. S.
28	5 16.27	2.080	21 45 41.76	135.01	− 7 54 37.2	729.5	66.81	15 56.8	58 24.9	I. S.
29	6 6.16	2.083	22 39 40.23	135.20	− 2 49 50.2	787.8	66.86	16 5.5	58 56.9	I. S.
30	6 56.55	2.122	23 34 8.32	137.53	+ 2 29 53.6	803.3	67.44	16 13.4	59 26.0	I. S.
Dec. 1	7 48.31	2.197	0 29 59.09	142.04	+ 7 46 15.8	+770.0	68.53	16 19.8	59 49.5	I. S.
2	8 42.23	2.299	1 27 59.44	148.17	12 38 31.2	681.8	69.99	16 23.8	60 4.2	I. S.
3	9 38.71	2.406	2 28 34.06	154.60	16 44 8.7	537.0	71.49	16 24.6	60 7.1	I. S.
4	10 37.50	2.485	3 31 27.72	159.38	19 41 27.3	342.6	72.58	16 21.6	59 56.0	I. S.
5	11 37.52	2.504	4 35 35.40	160.51	21 14 9.2	+118.3	72.82	16 14.7	59 30.6	I. S.
6	12 37.07	2.446	5 39 14.76	157.02	+21 16 1.4	−106.6	72.00	16 4.4	58 53.0	II. S.
7	13 34.41	2.324	6 40 41.38	149.69	19 52 35.7	−304.3	70.28	15 51.8	58 6.6	II. S.
8	14 28.39	2.171	7 38 45.24	140.48	17 18 23.8	−458.8	68.06	15 38.0	57 15.9	II. S.
9	15 18.64	2.019	8 33 5.04	131.32	13 51 46.3	−566.9	65.79	15 24.4	56 25.9	II. S.
10	16 5.49	1.891	9 24 0.35	123.61	9 50 24.5	−633.7	63.83	15 12.1	55 40.6	II. S.
11	16 49.67	1.798	10 12 15.03	118.00	+ 5 29 12.1	−667.4	62.37	15 1.7	55 2.7	II. S.
12	17 32.09	1.744	10 58 43.64	114.77	+ 0 59 59.0	−674.7	61.51	14 54.1	54 34.5	II. S.
13	18 13.69	1.730	11 44 23.41	113.93	− 3 27 41.8	−660.2	61.28	14 49.3	54 17.1	II. S.
14	18 55.41	1.753	12 30 9.99	115.33	− 7 45 25.9	−625.0	61.64	14 47.7	54 11.0	II. S.
15	19 38.11	1.810	13 16 55.14	118.75	−11 44 53.6	−568.4	62.53	14 48.9	54 15.7	II. S.
16	20 22.52	1.895	14 5 23.63	123.86	−15 16 55.4	−487.4	63.83	14 52.9	54 30.1	II. S.
17	21 9.19	1.997	14 56 8.34	129.98	−18 11 5.7	−378.6	65.37	14 59.1	54 53.0	II. S.
18	21 58.36	2.100	15 49 23.24	136.19	−20 15 55.8	−240.8	66.90	15 7.0	55 22.2	II. S.
19	22 49.83	2.185	16 44 56.51	141.30	−21 20 7.7	− 76.4	68.14	15 16.1	55 55.4	II. S.
20	23 42.95	2.235	17 42 8.76	144.31	−21 14 42.1	+105.4	68.86	15 25.6	56 30.2	
22	0 36.74	2.241	18 40 1.33	144.66	−19 55 26.8	+290.0	68.95	15 34.8	57 4.1	I. S.
23	1 30.20	2.210	19 37 34.44	142.80	−17 24 32.9	460.8	68.53	15 43.4	57 35.6	I. S.
24	2 22.65	2.159	20 34 6.37	139.78	−13 50 27.2	603.9	67.82	15 50.9	58 3.2	I. S.
25	3 13.86	2.111	21 29 24.44	136.84	− 9 26 19.7	710.1	67.15	15 57.2	58 26.3	I. S.
26	4 4.12	2.082	22 23 44.74	135.11	− 4 28 2.5	774.3	66.76	16 2.3	58 45.1	I. S.
27	4 54.04	2.084	23 17 44.90	135.26	+ 0 47 17.9	+795.0	66.84	16 6.2	58 59.6	I. S.
28	5 44.45	2.122	0 12 14.23	137.55	6 1 56.5	770.6	67.44	16 9.0	59 9.9	I. S.
29	6 36.19	2.193	1 8 3.29	141.82	10 57 29.6	699.2	68.51	16 10.7	59 16.0	I. S.
30	7 29.90	2.285	2 5 51.51	147.30	15 14 55.8	580.0	69.83	16 10.9	59 16.7	I. S.
31	8 25.82	2.373	3 5 52.71	152.61	+18 35 23.3	+415.3	71.07	16 9.4	59 11.1	I. S.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	22 32.8	17 16 7.06	−22 1 51.8	7.7	2.9	0.21	Feb. 15	0 35.0	22 16 3.63	−12 36 51.0	6.6	2.5	0.17
1	22 34.4	17 21 42.20	22 15 50.5	7.7	2.9	0.21	16	0 38.0	22 23 0.85	11 52 0.9	6.6	2.5	0.17
2	22 36.2	17 27 24.35	22 29 5.6	7.6	2.9	0.21	17	0 41.0	22 29 56.73	11 5 55.2	6.7	2.5	0.17
3	22 38.1	17 33 12.88	22 41 33.0	7.5	2.8	0.21	18	0 44.0	22 36 50.82	10 18 37.7	6.7	2.5	0.18
4	22 40.1	17 39 7.25	22 53 8.7	7.4	2.8	0.21	19	0 46.9	22 43 42.72	9 30 13.7	6.8	2.6	0.18
5	22 42.1	17 45 7.03	−23 3 49.5	7.3	2.7	0.20	20	0 49.7	22 50 31.85	− 8 40 48.2	6.9	2.6	0.18
6	22 44.2	17 51 11.74	23 13 32.1	7.2	2.7	0.20	21	0 52.5	22 57 17.57	7 50 28.5	7.0	2.6	0.18
7	22 46.4	17 57 21.06	23 22 13.9	7.1	2.7	0.20	22	0 55.2	23 3 59.15	6 59 22.6	7.1	2.7	0.18
8	22 48.7	18 3 34.64	23 29 52.4	7.1	2.7	0.20	23	0 57.9	23 10 35.73	6 7 39.7	7.2	2.7	0.18
9	22 51.0	18 9 52.16	23 36 25.4	7.0	2.6	0.19	24	1 0.4	23 17 6.33	5 15 30.6	7.3	2.8	0.19
10	22 53.4	18 16 13.34	−23 41 50.7	7.0	2.6	0.19	25	1 2.8	23 23 29.71	− 4 23 7.0	7.4	2.8	0.19
11	22 55.9	18 22 37.90	23 46 6.4	6.9	2.6	0.19	26	1 5.1	23 29 44.66	3 30 42.6	7.5	2.8	0.19
12	22 58.4	18 29 5.60	23 49 10.8	6.9	2.6	0.19	27	1 7.2	23 35 49.87	2 38 32.5	7.7	2.9	0.20
13	23 0.9	18 35 36.24	23 51 2.1	6.8	2.6	0.19	28	1 9.2	23 41 43.70	1 46 52.7	7.8	2.9	0.20
14	23 3.5	18 42 9.61	23 51 39.0	6.7	2.5	0.18	Mar. 1	1 11.0	23 47 24.44	0 56 0.9	8.0	3.0	0.21
15	23 6.2	18 48 45.54	−23 51 0.2	6.7	2.5	0.18	2	1 12.6	23 52 50.39	− 0 6 15.9	8.2	3.1	0.21
16	23 8.9	18 55 23.82	23 49 4.0	6.6	2.5	0.18	3	1 13.8	23 57 59.77	+ 0 42 2.9	8.4	3.1	0.22
17	23 11.6	19 2 4.28	23 45 49.5	6.6	2.5	0.18	4	1 14.6	0 2 50.66	1 28 35.9	8.6	3.2	0.22
18	23 14.4	19 8 46.76	23 41 15.5	6.5	2.5	0.18	5	1 15.1	0 7 21.23	2 13 3.1	8.9	3.3	0.23
19	23 17.2	19 15 31.14	23 35 21.1	6.5	2.5	0.18	6	1 15.3	0 11 29.71	2 55 4.8	9.1	3.4	0.23
20	23 20.0	19 22 17.29	−23 28 5.1	6.4	2.4	0.18	7	1 15.2	0 15 14.31	+ 3 34 21.8	9.4	3.5	0.24
21	23 22.8	19 29 5.04	23 19 26.8	6.4	2.4	0.18	8	1 14.6	0 18 33.51	4 10 35.2	9.7	3.6	0.25
22	23 25.7	19 35 54.27	23 9 25.1	6.4	2.4	0.18	9	1 13.5	0 21 25.91	4 43 28.1	10.0	3.7	0.25
23	23 28.6	19 42 44.89	22 57 59.4	6.4	2.4	0.18	10	1 11.9	0 23 50.28	5 12 44.5	10.3	3.8	0.26
24	23 31.5	19 49 36.77	22 45 8.9	6.4	2.4	0.18	11	1 9.9	0 25 45.72	5 38 9.3	10.6	3.9	0.27
25	23 34.4	19 56 29.80	−22 30 52.7	6.3	2.4	0.17	12	1 7.4	0 27 11.61	+ 5 59 30.0	10.9	4.1	0.28
26	23 37.4	20 3 23.87	22 15 10.4	6.3	2.4	0.17	13	1 4.4	0 28 7.65	6 16 35.5	11.2	4.2	0.28
27	23 40.3	20 10 18.91	21 58 1.2	6.3	2.4	0.17	14	1 0.9	0 28 33.89	6 29 17.1	11.6	4.3	0.29
28	23 43.3	20 17 14.81	21 39 24.7	6.3	2.4	0.17	15	0 56.9	0 28 30.78	6 37 29.1	11.9	4.5	0.30
29	23 46.3	20 24 11.50	21 19 20.4	6.3	2.4	0.17	16	0 52.5	0 27 59.32	6 41 8.1	12.3	4.6	0.31
30	23 49.3	20 31 8.91	−20 57 47.8	6.3	2.4	0.17	17	0 47.6	0 27 0.84	+ 6 40 14.4	12.7	4.8	0.32
31	23 52.3	20 38 6.95	20 34 46.5	6.3	2.4	0.17	18	0 42.3	0 25 37.17	6 34 51.7	13.0	4.9	0.33
Feb. 1	23 55.4	20 45 5.52	20 10 16.1	6.3	2.4	0.17	19	0 36.5	0 23 50.65	6 25 8.2	13.3	5.0	0.34
2	23 58.4	20 52 4.58	19 44 16.3	6.3	2.4	0.17	20	0 30.5	0 21 43.97	6 11 16.8	13.6	5.1	0.35
4	0 1.4	20 59 4.10	19 16 47.0	6.3	2.4	0.17	21	0 24.2	0 19 20.30	5 53 34.8	13.9	5.2	0.36
5	0 4.5	21 6 3.94	−18 47 48.1	6.3	2.4	0.17	22	0 17.7	0 16 43.06	+ 5 32 22.9	14.2	5.3	0.36
6	0 7.6	21 13 4.08	18 17 19.3	6.3	2.4	0.17	23	0 11.0	0 13 55.92	5 8 6.9	14.4	5.4	0.36
7	0 10.6	21 20 4.42	17 45 21.0	6.3	2.4	0.17	24	0 4.2	0 11 2.64	4 41 15.8	14.5	5.5	0.36
8	0 13.7	21 27 4.95	17 11 53.1	6.3	2.4	0.17	24	23 57.3	0 8 7.06	4 12 21.0	14.5	5.5	0.37
9	0 16.8	21 34 5.49	16 36 56.2	6.4	2.4	0.17	25	23 50.5	0 5 12.88	3 41 56.1	14.6	5.5	0.37
10	0 19.8	21 41 6.00	-16 0 30.5	6.4	2.4	0.17	26	23 43.8	0 2 23.58	+ 3 10 35.0	14.7	5.6	0.37
11	0 22.8	21 48 6.36	15 22 37.3	6.4	2.4	0.17	27	23 37.2	23 59 42.44	2 38 51.0	14.8	5.6	0.37
12	0 25.9	21 55 6.46	14 43 17.3	6.5	2.4	0.17	28	23 30.8	23 57 12.24	2 7 14.9	14.8	5.6	0.37
13	0 28.9	22 2 6.19	14 2 31.7	6.5	2.4	0.17	29	23 24.6	23 54 55.48	1 36 16.5	14.8	5.6	0.37
14	0 31.9	22 9 5.34	13 20 22.1	6.5	2.4	0.17	30	23 18.6	23 52 54.21	1 6 22.2	14.8	5.6	0.37
15	0 35.0	22 16 3.63	−12 36 51.0	6.6	2.5	0.17	31	23 12.9	23 51 9.98	+ 0 37 54.7	14.7	5.5	0.37
16	0 38.0	22 23 0.85	−11 52 0.9	6.6	2.5	0.17	Apr. 1	23 7.5	23 49 44.03	+ 0 11 13.1	14.6	5.5	0.37

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	23 7.5	23 49 44.03	+ 0 11 13.1	14.6	5.5	0.37	May 16	23 0.7	2 40 15.97	+13 58 51.3	7.3	2.7	0.19
2	23 2.5	23 48 37.10	− 0 13 26.6	14.5	5.5	0.37	17	23 4.2	2 47 42.07	14 42 24.1	7.2	2.7	0.19
3	22 57.8	23 47 49.73	0 35 52.6	14.3	5.4	0.36	18	23 7.9	2 55 18.71	15 25 52.3	7.1	2.7	0.19
4	22 53.4	23 47 22.07	0 55 55.5	14.1	5.3	0.36	19	23 11.7	3 3 6.04	16 9 7.7	7.0	2.6	0.19
5	22 49.4	23 47 14.05	1 13 29.2	13.9	5.2	0.35	20	23 15.7	3 11 4.11	16 52 1.2	6.9	2.6	0.18
6	22 45.6	23 47 25.40	− 1 28 29.5	13.7	5.2	0.35	21	23 19.9	3 19 12.92	+17 34 22.7	6.9	2.6	0.18
7	22 42.1	23 47 55.65	1 40 55.1	13.4	5.1	0.35	22	23 24.3	3 27 32.35	18 16 1.4	6.9	2.6	0.18
8	22 39.0	23 48 44.31	1 50 45.5	13.2	5.0	0.34	23	23 28.8	3 36 2.12	18 56 46.0	6.8	2.6	0.18
9	22 36.2	23 49 50.67	1 58 2.0	13.0	4.9	0.34	24	23 33.5	3 44 41.89	19 36 24.6	6.8	2.6	0.18
10	22 33.7	23 51 14.04	2 2 46.8	12.8	4.8	0.33	25	23 38.4	3 53 31.11	20 14 44.8	6.7	2.5	0.18
11	22 31.4	23 52 53.71	− 2 5 3.1	12.6	4.8	0.32	26	23 43.4	4 2 29.13	+20 51 34.1	6.7	2.5	0.18
12	22 29.4	23 54 48.91	2 4 54.5	12.3	4.7	0.32	27	23 48.5	4 11 35.01	21 26 39.9	6.7	2.5	0.18
13	22 27.6	23 56 58.87	2 2 24.9	12.1	4.6	0.31	28	23 53.7	4 20 47.74	21 59 49.9	6.7	2.5	0.18
14	22 26.1	23 59 22.92	1 57 38.8	11.9	4.5	0.31	29	23 59.1	4 30 6.11	22 30 52.8	6.7	2.5	0.18
15	22 24.8	0 2 0.28	1 50 40.6	11.7	4.4	0.30	31	0 4.5	4 39 28.89	22 59 37.9	6.7	2.5	0.18
16	22 23.7	0 4 50.31	− 1 41 34.9	11.5	4.4	0.29	June 1	0 10.0	4 48 54.62	+23 25 56.1	6.8	2.5	0.18
17	22 22.7	0 7 52.41	1 30 26.3	11.3	4.3	0.29	2	0 15.5	4 58 21.84	23 49 39.9	6.8	2.5	0.18
18	22 21.9	0 11 5.92	1 17 19.0	11.1	4.2	0.28	3	0 21.0	5 7 48.98	24 10 43.1	6.8	2.6	0.19
19	22 21.4	0 14 30.32	1 2 17.6	10.9	4.1	0.28	4	0 26.5	5 17 14.71	24 28 59.9	6.9	2.6	0.19
20	22 21.1	0 18 5.09	0 45 26.5	10.7	4.1	0.27	5	0 31.9	5 26 37.42	24 44 29.2	6.9	2.6	0.19
21	22 20.9	0 21 49.78	− 0 26 49.6	10.5	4.0	0.26	6	0 37.2	5 35 55.75	+24 57 10.5	7.0	2.6	0.19
22	22 20.9	0 25 43.93	− 0 6 31.4	10.3	3.9	0.26	7	0 42.4	5 45 8.39	25 7 4.9	7.0	2.6	0.19
23	22 21.0	0 29 47.20	+ 0 15 24.6	10.1	3.9	0.25	8	0 47.6	5 54 14.14	25 14 14.4	7.1	2.7	0.20
24	22 21.3	0 33 59.23	0 38 54.5	10.0	3.8	0.25	9	0 52.6	6 3 12.01	25 18 42.9	7.1	2.7	0.20
25	22 21.7	0 38 19.76	1 3 54.7	9.8	3.8	0.24	10	0 57.5	6 12 0.97	25 20 35.1	7.2	2.7	0.20
26	22 22.2	0 42 48.53	+ 1 30 21.6	9.7	3.7	0.24	11	1 2.2	6 20 40.26	+25 19 56.6	7.3	2.7	0.20
27	22 22.8	0 47 25.34	1 58 11.9	9.5	3.7	0.24	12	1 6.7	6 29 9.20	25 16 54.1	7.4	2.8	0.20
28	22 23.6	0 52 9.99	2 27 22.2	9.4	3.6	0.23	13	1 11.0	6 37 27.13	25 11 34.4	7.5	2.8	0.21
29	22 24.6	0 57 2.38	2 57 49.4	9.2	3.6	0.23	14	1 15.2	6 45 33.66	25 4 4.9	7.6	2.8	0.21
30	22 25.7	1 2 2.39	3 29 30.1	9.1	3.5	0.23	15	1 19.2	6 53 28.36	24 54 32.8	7.7	2.9	0.21
May 1	22 26.9	1 7 10.00	+ 4 2 21.3	8.9	3.4	0.22	16	1 22.9	7 1 10.95	+24 43 5.9	7.8	2.9	0.21
2	22 28.1	1 12 25.18	4 36 20.0	8.8	3.3	0.22	17	1 26.4	7 8 41.13	24 29 51.8	7.9	2.9	0.22
3	22 29.5	1 17 47.93	5 11 23.2	8.7	3.3	0.22	18	1 29.7	7 15 58.75	24 14 57.8	8.0	3.0	0.22
4	22 31.1	1 23 18.33	5 47 27.9	8.5	3.2	0.22	19	1 32.8	7 23 3.63	23 58 31.8	8.1	3.0	0.23
5	22 32.8	1 28 56.46	6 24 31.0	8.4	3.1	0.21	20	1 35.8	7 29 55.65	23 40 40.9	8.3	3.1	0.23
6	22 34.6	1 34 42.42	+ 7 2 29.2	8.3	3.1	0.21	21	1 38.6	7 36 34.77	+23 21 32.3	8.4	3.1	0.23
7	22 36.6	1 40 36.37	7 41 19.1	8.2	3.1	0.21	22	1 41.1	7 43 0.86	23 1 13.0	8.6	3.2	0.23
8	22 38.7	1 46 38.47	8 20 57.5	8.1	3.0	0.21	23	1 43.3	7 49 13.91	22 39 49.9	8.7	3.2	0.24
9	22 40.9	1 52 48.88	9 1 20.4	8.0	3.0	0.21	24	1 45.3	7 55 13.86	22 17 29.8	8.9	3.3	0.24
10	22 43.3	1 59 7.89	9 42 24.4	7.8	2.9	0.20	25	1 47.1	8 1 0.61	21 54 18.9	9.0	3.4	0.24
11	22 45.8	2 5 35.70	+10 24 5.3	7.7	2.9	0.20	26	1 48.8	8 6 34.09	+21 30 23.8	9.1	3.4	0.24
12	22 48.4	2 12 12.58	11 6 18.4	7.6	2.9	0.20	27	1 50.2	8 11 54.27	21 5 50.9	9.3	3.5	0.25
13	22 51.2	2 18 58.78	11 48 59.1	7.5	2.8	0.20	28	1 51.4	8 17 1.05	20 40 47.0	9.4	3.5	0.25
14	22 54.2	2 25 54.57	12 32 2.2	7.4	2.8	0.20	29	1 52.3	8 21 54.30	20 15 17.5	9.6	3.6	0.25
15	22 57.4	2 33 0.22	13 15 21.7	7.3	2.7	0.19	30	1 53.0	8 26 33.92	19 49 28.7	9.8	3.7	0.26
16	23 0.7	2 40 15.97	+13 58 51.3	7.3	2.7	0.19	July 1	1 53.5	8 30 59.75	+19 23 26.5	10.0	3.7	0.27
17	23 4.2	2 47 42.07	+14 42 24.1	7.2	2.7	0.19	2	1 53.7	8 35 11.62	+18 57 17.1	10.2	3.8	0.27

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	1 53.5	8 30 59.75	+19 23 26.5	10.0	3.7	0.27	Aug. 15	22 50.7	8 29 2.71	+17 21 55.5	11.0	4.1	0.29
2	1 53.7	8 35 11.62	18 57 17.1	10.2	3.8	0.27	16	22 49.7	8 32 2.09	17 28 45.7	10.7	4.0	0.28
3	1 53.7	8 39 9.32	18 31 6.6	10.4	3.9	0.28	17	22 49.2	8 35 30.29	17 33 21.2	10.4	3.9	0.28
4	1 53.5	8 42 52.64	18 5 0.8	10.6	4.0	0.28	18	22 49.3	8 39 26.42	17 35 33.0	10.1	3.8	0.27
5	1 53.1	8 46 21.33	17 39 6.0	10.8	4.1	0.29	19	22 49.8	8 43 49.43	17 35 11.7	9.8	3.7	0.26
6	1 52.4	8 49 35.11	+17 13 28.5	11.0	4.1	0.29	20	22 50.7	8 48 38.05	+17 32 9.6	9.5	3.6	0.25
7	1 51.4	8 52 33.66	16 48 14.3	11.2	4.2	0.30	21	22 51.9	8 53 50.76	17 26 19.8	9.2	3.5	0.24
8	1 50.2	8 55 16.68	16 23 29.9	11.4	4.3	0.30	22	22 53.5	8 59 25.85	17 17 37.5	9.0	3.4	0.23
9	1 48.7	8 57 43.81	15 59 21.7	11.6	4.4	0.31	23	22 55.5	9 5 21.40	17 5 58.9	8.7	3.3	0.22
10	1 46.9	8 59 54.69	15 35 56.5	11.9	4.5	0.31	24	22 57.8	9 11 35.43	16 51 22.3	8.5	3.2	0.22
11	1 44.9	9 1 48.95	+15 13 21.1	12.1	4.5	0.31	25	23 0.4	9 18 5.81	+16 33 47.8	8.3	3.1	0.21
12	1 42.6	9 3 26.21	14 51 42.3	12.4	4.6	0.32	26	23 3.2	9 24 50.37	16 13 17.5	8.1	3.0	0.21
13	1 40.0	9 4 46.09	14 31 6.9	12.6	4.7	0.32	27	23 6.1	9 31 46.91	15 49 56.0	7.9	3.0	0.20
14	1 37.1	9 5 48.26	14 11 42.2	12.8	4.8	0.33	28	23 9.2	9 38 53.20	15 23 49.2	7.7	2.9	0.20
15	1 33.9	9 6 32.38	13 53 35.1	13.0	4.9	0.34	29	23 12.5	9 46 7.14	14 55 5.0	7.6	2.9	0.20
16	1 30.4	9 6 58.19	+13 36 53.1	13.2	5.0	0.34	30	23 15.9	9 53 26.71	+14 23 52.0	7.4	2.8	0.20
17	1 26.6	9 7 5.49	13 21 42.9	13.4	5.1	0.35	31	23 19.3	10 0 50.09	13 50 21.1	7.3	2.8	0.19
18	1 22.5	9 6 54.16	13 8 11.5	13.6	5.2	0.35	Sept. 1	23 22.8	10 8 15.59	13 14 43.1	7.2	2.7	0.19
19	1 18.1	9 6 24.18	12 56 25.4	13.8	5.2	0.36	2	23 26.3	10 15 41.71	12 37 9.5	7.1	2.6	0.18
20	1 13.3	9 5 35.70	12 46 30.9	14.0	5.3	0.36	3	23 29.8	10 23 7.18	11 57 52.1	7.0	2.6	0.18
21	1 8.2	9 4 29.03	+12 38 33.6	14.1	5.3	0.36	4	23 33.2	10 30 30.90	+11 17 2.4	6.9	2.6	0.18
22	1 2.9	9 3 4.66	12 32 38.5	14.3	5.4	0.37	5	23 36.6	10 37 51.98	10 34 51.7	6.8	2.6	0.18
23	0 57.3	9 1 23.32	12 28 49.4	14.5	5.5	0.37	6	23 39.9	10 45 9.68	9 51 30.7	6.7	2.5	0.17
24	0 51.4	8 59 26.04	12 27 9.1	14.7	5.5	0.38	7	23 43.2	10 52 23.42	9 7 9.5	6.7	2.5	0.17
25	0 45.3	8 57 14.08	12 27 38.9	14.8	5.6	0.38	8	23 46.4	10 59 32.80	8 21 57.9	6.6	2.5	0.17
26	0 39.0	8 54 48.99	+12 30 18.6	14.8	5.6	0.38	9	23 49.5	11 6 37.52	+ 7 36 4.8	6.5	2.5	0.17
27	0 32.5	8 52 12.69	12 35 6.7	14.9	5.6	0.38	10	23 52.6	11 13 37.34	6 49 38.0	6.5	2.5	0.17
28	0 25.8	8 49 27.31	12 41 59.1	14.9	5.6	0.38	11	23 55.6	11 20 32.20	6 2 45.1	6.4	2.4	0.16
29	0 19.0	8 46 35.29	12 50 50.5	15.0	5.7	0.38	12	23 58.4	11 27 22.10	5 15 32.2	6.4	2.4	0.16
30	0 12.2	8 43 39.39	13 1 33.4	15.0	5.7	0.38	14	0 1.2	11 34 7.06	4 28 5.5	6.4	2.4	0.16
31	0 5.3	8 40 42.55	+13 13 58.6	14.9	5.6	0.38	15	0 3.9	11 40 47.18	+ 3 40 30.9	6.4	2.4	0.16
31	23 58.4	8 37 47.81	13 27 55.4	14.9	5.6	0.38	16	0 6.5	11 47 22.49	2 52 53.4	6.3	2.4	0.16
Aug. 1	23 51.6	8 34 58.34	13 43 11.2	14.8	5.5	0.37	17	0 9.1	11 53 53.15	2 5 17.5	6.3	2.4	0.16
2	23 45.0	8 32 17.30	13 59 32.9	14.6	5.5	0.37	18	0 11.6	12 0 19.33	1 17 47.3	6.3	2.4	0.16
3	23 38.7	8 29 47.86	14 16 46.2	14.4	5.4	0.37	19	0 14.0	12 6 41.24	+ 0 30 26.0	6.3	2.4	0.16
4	23 32.6	8 27 33.02	+14 34 36.3	14.3	5.4	0.37	20	0 16.4	12 12 59.10	− 0 16 43.2	6.3	2.4	0.16
5	23 26.7	8 25 35.60	14 52 48.2	14.1	5.3	0.36	21	0 18.7	12 19 13.09	1 3 37.1	6.3	2.4	0.16
6	23 21.1	8 23 58.17	15 11 6.7	13.8	5.2	0.36	22	0 20.9	12 25 23.36	1 50 13.0	6.3	2.4	0.16
7	23 15.9	8 22 43.11	15 29 17.0	13.5	5.1	0.35	23	0 23.1	12 31 30.14	2 36 28.4	6.3	2.4	0.16
8	23 11.1	8 21 52.38	15 47 4.3	13.3	5.0	0.34	24	0 25.2	12 37 33.65	3 22 21.4	6.3	2.4	0.16
9	23 6.8	8 21 27.72	+16 4 14.6	13.0	4.9	0.34	25	0 27.3	12 43 34.09	− 4 7 49.9	6.3	2.4	0.16
10	23 2.9	8 21 30.49	16 20 33.8	12.7	4.7	0.33	26	0 29.3	12 49 31.62	4 52 51.5	6.4	2.4	0.16
11	22 59.5	8 22 1.79	16 35 48.7	12.4	4.6	0.32	27	0 31.2	12 55 26.42	5 37 25.0	6.4	2.4	0.16
12	22 56.6	8 23 2.33	16 49 46.4	12.0	4.5	0.31	28	0 33.1	13 1 18.67	6 21 28.6	6.4	2.4	0.16
13	22 54.1	8 24 32.62	17 2 14.8	11.7	4.4	0.30	29	0 35.0	13 7 8.54	7 5 0.8	6.4	2.4	0.16
14	22 52.2	8 26 32.77	+17 13 1.6	11.3	4.3	0.30	30	0 36.9	13 12 56.21	− 7 47 59.9	6.4	2.4	0.16
15	22 50.7	8 29 2.71	+17 21 55.5	11.0	4.1	0.29	Oct. 1	0 38.7	13 18 41.81	− 8 30 24.9	6.4	2.4	0.17

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Oct. 1	0 38.7	13 18 41.81	− 8 30 24.9	6.4	2.4	0.17
2	0 40.5	13 24 25.44	9 12 14.1	6.5	2.4	0.17
3	0 42.2	13 30 7.27	9 53 26.3	6.5	2.5	0.17
4	0 43.9	13 35 47.41	10 34 0.1	6.5	2.5	0.17
5	0 45.6	13 41 25.93	11 13 54.7	6.6	2.5	0.17
6	0 47.3	13 47 2.92	−11 53 8.2	6.6	2.5	0.17
7	0 49.0	13 52 38.46	12 31 39.6	6.7	2.5	0.17
8	0 50.6	13 58 12.61	13 9 27.8	6.7	2.5	0.17
9	0 52.2	14 3 45.40	13 46 31.3	6.7	2.5	0.17
10	0 53.8	14 9 16.83	14 22 48.8	6.8	2.5	0.17
11	0 55.4	14 14 46.94	−14 58 18.9	6.8	2.6	0.18
12	0 56.9	14 20 15.68	15 33 0.6	6.9	2.6	0.18
13	0 58.4	14 25 42.98	16 6 51.8	7.0	2.6	0.18
14	0 59.9	14 31 8.80	16 39 51.4	7.0	2.6	0.18
15	1 1.3	14 36 33.01	17 11 57.6	7.1	2.7	0.18
16	1 2.7	14 41 55.46	−17 43 8.9	7.1	2.7	0.19
17	1 4.1	14 47 15.97	18 13 23.3	7.2	2.8	0.19
18	1 5.5	14 52 34.34	18 42 39.1	7.3	2.8	0.19
19	1 6.8	14 57 50.27	19 10 54.4	7.4	2.8	0.19
20	1 8.1	15 3 3.43	19 38 7.0	7.5	2.8	0.19
21	1 9.3	15 8 13.48	−20 4 14.9	7.6	2.9	0.20
22	1 10.4	15 13 19.98	20 29 15.8	7.7	2.9	0.20
23	1 11.5	15 18 22.39	20 53 7.2	7.8	2.9	0.21
24	1 12.5	15 23 20.12	21 15 46.2	7.9	2.9	0.21
25	1 13.4	15 28 12.49	21 37 10.4	8.0	3.0	0.22
26	1 14.2	15 32 58.68	−21 57 16.5	8.1	3.1	0.22
27	1 15.0	15 37 37.83	22 16 1.3	8.2	3.2	0.23
28	1 15.6	15 42 8.88	22 33 21.6	8.4	3.2	0.23
29	1 16.0	15 46 30.71	22 49 13.2	8.5	3.3	0.23
30	1 16.3	15 50 41.96	23 3 32.1	8.7	3.3	0.24
31	1 16.3	15 54 41.19	−23 16 13.4	8.9	3.4	0.25
Nov. 1	1 16.1	15 58 26.68	23 27 13.4	9.1	3.4	0.25
2	1 15.7	16 1 56.62	23 36 25.3	9.3	3.5	0.26
3	1 15.0	16 5 8.95	23 43 43.4	9.5	3.5	0.27
4	1 13.9	16 8 1.37	23 49 1.2	9.7	3.6	0.27
5	1 12.4	16 10 31.41	−23 52 10.8	9.9	3.7	0.28
6	1 10.6	16 12 36.46	23 53 4.2	10.1	3.8	0.28
7	1 8.3	16 14 13.71	23 51 32.1	10.4	3.9	0.29
8	1 5.4	16 15 20.27	23 47 24.7	10.6	4.0	0.29
9	1 2.0	16 15 53.26	23 40 31.2	10.9	4.1	0.30
10	0 58.0	16 15 49.98	−23 30 40.9	11.2	4.2	0.31
11	0 53.4	16 15 7.97	23 17 42.4	11.5	4.3	0.31
12	0 48.1	16 13 45.45	23 1 25.7	11.8	4.4	0.32
13	0 42.1	16 11 41.44	22 41 43.0	12.1	4.5	0.32
14	0 35.4	16 8 56.01	22 18 29.8	12.3	4.6	0.33
15	0 28.1	16 5 30.98	−21 51 48.8	12.5	4.7	0.34
16	0 20.2	16 1 29.70	−21 21 49.9	12.7	4.8	0.35
Nov. 16	0 20.2	16 1 29.70	−21 21 49.9	12.7	4.8	0.35
17	0 11.7	15 56 57.45	20 48 53.4	12.9	4.9	0.35
18	0 2.9	15 52 1.43	20 13 32.2	12.9	4.9	0.35
18	23 53.8	15 46 50.51	19 36 30.4	12.9	4.9	0.35
19	23 44.6	15 41 34.57	18 58 44.2	12.9	4.9	0.35
20	23 35.5	15 36 24.07	−18 21 17.0	12.9	4.9	0.34
21	23 26.7	15 31 29.16	17 45 14.9	12.9	4.9	0.34
22	23 18.3	15 26 59.03	17 11 40.8	12.9	4.9	0.34
23	23 10.4	15 23 1.25	16 41 30.3	12.7	4.8	0.33
24	23 3.2	15 19 41.63	16 15 27.2	12.4	4.7	0.32
25	22 56.6	15 17 3.92	−15 54 2.0	12.1	4.6	0.31
26	22 50.7	15 15 10.00	15 37 30.2	11.9	4.5	0.30
27	22 45.7	15 14 0.12	15 25 55.3	11.6	4.4	0.30
28	22 41.3	15 13 33.25	15 19 9.4	11.3	4.3	0.29
29	22 37.6	15 13 47.42	15 16 56.9	11.0	4.2	0.28
30	22 34.6	15 14 40.04	−15 18 56.2	10.7	4.1	0.27
Dec. 1	22 32.1	15 16 8.10	15 24 42.9	10.4	4.0	0.26
2	22 30.2	15 18 8.56	15 33 50.6	10.1	3.8	0.26
3	22 28.7	15 20 38.31	15 45 53.1	9.9	3.7	0.26
4	22 27.7	15 23 34.41	16 0 25.0	9.6	3.6	0.25
5	22 27.1	15 26 54.08	−16 17 2.3	9.4	3.5	0.24
6	22 26.8	15 30 34.81	16 35 22.7	9.1	3.4	0.23
7	22 26.9	15 34 34.26	16 55 5.9	8.9	3.4	0.23
8	22 27.1	15 38 50.43	17 15 53.7	8.7	3.3	0.23
9	22 27.6	15 43 21.45	17 37 29.8	8.5	3.2	0.22
10	22 28.5	15 48 5.77	−17 59 39.7	8.3	3.1	0.22
11	22 29.5	15 53 1.94	18 22 10.6	8.1	3.0	0.21
12	22 30.7	15 58 8.74	18 44 51.1	8.0	3.0	0.21
13	22 32.0	16 3 25.08	19 7 31.5	7.8	3.0	0.21
14	22 33.5	16 8 50.04	19 30 2.6	7.7	3.0	0.21
15	22 35.1	16 14 22.81	−19 52 16.8	7.6	2.9	0.20
16	22 36.8	16 20 2.65	20 14 7.1	7.5	2.9	0.20
17	22 38.6	16 25 49.00	20 35 27.6	7.4	2.9	0.20
18	22 40.5	16 31 41.23	20 56 13.0	7.3	2.9	0.20
19	22 42.6	16 37 38.94	21 16 18.1	7.2	2.8	0.20
20	22 44.7	16 43 41.68	−21 35 38.6	7.1	2.8	0.19
21	22 46.9	16 49 49.09	21 54 11.7	7.1	2.7	0.19
22	22 49.1	16 56 0.86	22 11 52.7	7.0	2.6	0.19
23	22 51.4	17 2 16.71	22 28 38.8	7.0	2.6	0.19
24	22 53.8	17 8 36.34	22 44 27.2	6.9	2.6	0.19
25	22 56.2	17 14 59.49	−22 59 15.5	6.8	2.5	0.18
26	22 58.7	17 21 26.03	23 13 0.9	6.7	2.5	0.18
27	23 1.2	17 27 55.73	23 25 41.6	6.6	2.5	0.18
28	23 3.8	17 34 28.43	23 37 15.3	6.6	2.5	0.18
29	23 6.5	17 41 3.96	23 47 40.3	6.5	2.5	0.18
30	23 9.2	17 47 42.17	−23 56 54.6	6.5	2.4	0.18
31	23 11.9	17 54 22.92	−24 4 56.6	6.4	2.4	0.18

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	1 55.8	20 35 46.52	−20 22 52.9	6.0	5.8	0.42	Feb. 15	2 29.6	0 10 57.23	+ 0 27 35.2	7.2	6.9	0.46
1	1 57.0	20 40 54.72	20 4 19.7	6.0	5.8	0.42	16	2 30.0	0 15 18.38	0 59 7.8	7.2	7.0	0.46
2	1 58.2	20 46 1.55	19 45 12.2	6.1	5.8	0.42	17	2 30.4	0 19 39.25	1 30 39.5	7.3	7.0	0.46
3	1 59.3	20 51 7.00	19 25 31.1	6.1	5.9	0.42	18	2 30.8	0 23 59.89	2 2 9.6	7.3	7.0	0.47
4	2 0.5	20 56 11.07	19 5 17.1	6.1	5.9	0.42	19	2 31.2	0 28 20.33	2 33 37.5	7.4	7.1	0.47
5	2 1.6	21 1 13.75	−18 44 31.0	6.1	5.9	0.42	20	2 31.6	0 32 40.61	+ 3 5 2.4	7.4	7.1	0.47
6	2 2.7	21 6 15.02	18 23 13.6	6.1	5.9	0.42	21	2 31.9	0 37 0.77	3 36 23.6	7.4	7.1	0.47
7	2 3.7	21 11 14.88	18 1 25.5	6.2	6.0	0.42	22	2 32.3	0 41 20.85	4 7 40.5	7.5	7.2	0.47
8	2 4.7	21 16 13.34	17 39 7.6	6.2	6.0	0.42	23	2 32.7	0 45 40.89	4 38 52.3	7.5	7.2	0.48
9	2 5.7	21 21 10.39	17 16 20.7	6.2	6.0	0.42	24	2 33.1	0 50 0.93	5 9 58.3	7.6	7.3	0.48
10	2 6.7	21 26 6.04	−16 53 5.5	6.2	6.0	0.42	25	2 33.5	0 54 20.99	+ 5 40 57.8	7.6	7.3	0.48
11	2 7.7	21 31 0.29	16 29 22.9	6.2	6.0	0.42	26	2 33.9	0 58 41.11	6 11 50.2	7.6	7.3	0.48
12	2 8.6	21 35 53.15	16 5 13.6	6.3	6.1	0.42	27	2 34.3	1 3 1.33	6 42 34.7	7.7	7.4	0.49
13	2 9.5	21 40 44.63	15 40 38.3	6.3	6.1	0.42	28	2 34.7	1 7 21.66	7 13 10.5	7.7	7.4	0.49
14	2 10.4	21 45 34.75	15 15 37.9	6.3	6.1	0.43	Mar. 1	2 35.1	1 11 42.15	7 43 37.0	7.8	7.5	0.50
15	2 11.3	21 50 23.51	−14 50 13.2	6.3	6.1	0.43	2	2 35.5	1 16 2.82	+ 8 13 53.5	7.8	7.5	0.50
16	2 12.1	21 55 10.95	14 24 25.0	6.3	6.1	0.43	3	2 35.9	1 20 23.70	8 43 59.2	7.8	7.5	0.50
17	2 12.9	21 59 57.08	13 58 14.0	6.4	6.2	0.43	4	2 36.3	1 24 44.82	9 13 53.4	7.9	7.6	0.51
18	2 13.7	22 4 41.94	13 31 41.0	6.4	6.2	0.43	5	2 36.7	1 29 6.21	9 43 35.3	7.9	7.6	0.51
19	2 14.5	22 9 25.54	13 4 46.9	6.4	6.2	0.43	6	2 37.1	1 33 27.86	10 13 4.4	8.0	7.7	0.52
20	2 15.3	22 14 7.89	−12 37 32.3	6.4	6.2	0.43	7	2 37.5	1 37 49.81	+10 42 19.9	8.0	7.7	0.52
21	2 16.0	22 18 49.04	12 9 58.0	6.5	6.2	0.43	8	2 38.0	1 42 12.08	11 11 21.1	8.0	7.7	0.52
22	2 16.7	22 23 29.01	11 42 4.9	6.5	6.3	0.43	9	2 38.4	1 46 34.69	11 40 7.3	8.1	7.8	0.53
23	2 17.4	22 28 7.83	11 13 53.7	6.5	6.3	0.43	10	2 38.8	1 50 57.65	12 8 37.8	8.1	7.8	0.53
24	2 18.1	22 32 45.53	10 45 25.4	6.6	6.3	0.44	11	2 39.3	1 55 20.99	12 36 51.9	8.2	7.9	0.54
25	2 18.8	22 37 22.14	−10 16 40.5	6.6	6.3	0.44	12	2 39.7	1 59 44.73	+13 4 48.9	8.3	8.0	0.54
26	2 19.4	22 41 57.68	9 47 39.8	6.6	6.3	0.44	13	2 40.2	2 4 8.89	13 32 28.2	8.3	8.0	0.55
27	2 20.0	22 46 32.20	9 18 24.1	6.6	6.4	0.44	14	2 40.7	2 8 33.46	13 59 49.2	8.4	8.1	0.55
28	2 20.7	22 51 5.72	8 48 54.3	6.6	6.4	0.44	15	2 41.1	2 12 58.49	14 26 51.2	8.4	8.1	0.56
29	2 21.3	22 55 38.29	8 19 11.1	6.7	6.4	0.44	16	2 41.6	2 17 23.98	14 53 33.5	8.5	8.2	0.56
30	2 21.9	23 0 9.93	− 7 49 15.5	6.7	6.5	0.44	17	2 42.1	2 21 49.93	+15 19 55.4	8.5	8.2	0.57
31	2 22.4	23 4 40.66	7 19 8.1	6.7	6.5	0.44	18	2 42.6	2 26 16.34	15 45 56.3	8.6	8.3	0.57
Feb. 1	2 23.0	23 9 10.52	6 48 49.6	6.7	6.5	0.44	19	2 43.1	2 30 43.24	16 11 35.5	8.6	8.3	0.58
2	2 23.5	23 13 39.56	6 18 20.9	6.8	6.5	0.44	20	2 43.6	2 35 10.63	16 36 52.5	8.7	8.4	0.58
3	2 24.1	23 18 7.80	5 47 42.8	6.8	6.6	0.45	21	2 44.1	2 39 38.51	17 1 46.6	8.7	8.5	0.59
4	2 24.6	23 22 35.27	− 5 16 56.0	6.8	6.6	0.45	22	2 44.6	2 44 6.88	+17 26 17.2	8.8	8.5	0.60
5	2 25.1	23 27 2.01	4 46 1.3	6.9	6.6	0.45	23	2 45.2	2 48 35.75	17 50 23.6	8.9	8.6	0.60
6	2 25.6	23 31 28.05	4 14 59.4	6.9	6.6	0.45	24	2 45.7	2 53 5.13	18 14 5.3	8.9	8.6	0.61
7	2 26.1	23 35 53.43	3 43 51.2	6.9	6.7	0.45	25	2 46.3	2 57 35.00	18 37 21.7	9.0	8.7	0.61
8	2 26.6	23 40 18.19	3 12 37.4	6.9	6.7	0.45	26	2 46.9	3 2 5.36	19 0 12.2	9.1	8.8	0.62
9	2 27.0	23 44 42.36	− 2 41 18.8	7.0	6.8	0.45	27	2 47.4	3 6 36.19	+19 22 36.2	9.2	8.9	0.63
10	2 27.5	23 49 5.98	2 9 56.0	7.0	6.8	0.45	28	2 48.0	3 11 7.48	19 44 33.1	9.2	9.0	0.63
11	2 27.9	23 53 29.10	1 38 29.7	7.0	6.8	0.45	29	2 48.6	3 15 39.21	20 6 2.3	9.3	9.0	0.64
12	2 28.3	23 57 51.75	1 7 0.7	7.1	6.8	0.46	30	2 49.2	3 20 11.36	20 27 3.2	9.4	9.1	0.64
13	2 28.8	0 2 13.96	0 35 29.8	7.1	6.8	0.46	31	2 49.8	3 24 43.92	20 47 35.2	9.4	9.1	0.65
14	2 29.2	0 6 35.78	− 0 3 57.6	7.2	6.9	0.46	Apr. 1	2 50.4	3 29 16.83	+21 7 37.9	9.5	9.2	0.66
15	2 29.6	0 10 57.23	+ 0 27 35.2	7.2	6.9	0.46	2	2 51.0	3 33 50.06	+21 27 10.8	9.6	9.3	0.66

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Apr. 1	2 50.4	3 29 16.83	+21 7 37.9	9.5	9.2	0.66
2	2 51.0	3 33 50.06	21 27 10.8	9.6	9.3	0.66
3	2 51.6	3 38 23.58	21 46 13.3	9.6	9.3	0.66
4	2 52.3	3 42 57.35	22 4 45.0	9.7	9.4	0.67
5	2 52.9	3 47 31.33	22 22 45.4	9.8	9.5	0.68
6	2 53.5	3 52 5.46	+22 40 13.9	9.9	9.6	0.69
7	2 54.1	3 56 39.71	22 57 10.2	10.0	9.6	0.69
8	2 54.8	4 1 14.02	23 13 33.9	10.1	9.7	0.70
9	2 55.4	4 5 48.33	23 29 24.7	10.2	9.8	0.71
10	2 56.0	4 10 22.59	23 44 42.1	10.3	9.9	0.72
11	2 56.7	4 14 56.74	+23 59 25.9	10.4	10.0	0.73
12	2 57.3	4 19 30.72	24 13 35.6	10.5	10.1	0.73
13	2 57.9	4 24 4.45	24 27 11.0	10.6	10.2	0.74
14	2 58.5	4 28 37.89	24 40 11.9	10.7	10.3	0.75
15	2 59.1	4 33 10.96	24 52 38.1	10.8	10.4	0.76
16	2 59.7	4 37 43.59	+25 4 29.4	10.9	10.5	0.77
17	3 0.3	4 42 15.70	25 15 45.6	11.0	10.6	0.78
18	3 0.9	4 46 47.22	25 26 26.4	11.1	10.7	0.79
19	3 1.4	4 51 18.07	25 36 31.8	11.2	10.8	0.80
20	3 2.0	4 55 48.18	25 46 1.7	11.3	10.9	0.81
21	3 2.6	5 0 17.46	+25 54 56.0	11.4	11.1	0.82
22	3 3.1	5 4 45.82	26 3 14.6	11.5	11.2	0.83
23	3 3.6	5 9 13.18	26 10 57.7	11.6	11.3	0.84
24	3 4.1	5 13 39.46	26 18 5.3	11.8	11.4	0.85
25	3 4.5	5 18 4.55	26 24 37.4	11.9	11.5	0.86
26	3 5.0	5 22 28.35	+26 30 34.0	12.0	11.6	0.87
27	3 5.4	5 26 50.76	26 35 55.4	12.2	11.8	0.88
28	3 5.8	5 31 11.67	26 40 41.6	12.3	11.9	0.89
29	3 6.2	5 35 30.97	26 44 52.9	12.4	12.0	0.90
30	3 6.6	5 39 48.54	26 48 29.6	12.6	12.1	0.91
May 1	3 6.9	5 44 4.25	+26 51 31.9	12.7	12.3	0.92
2	3 7.2	5 48 17.99	26 54 0.0	12.9	12.5	0.93
3	3 7.5	5 52 29.63	26 55 54.4	13.0	12.6	0.94
4	3 7.6	5 56 39.04	26 57 15.5	13.2	12.8	0.95
5	3 7.8	6 0 46.11	26 58 3.7	13.3	12.9	0.96
6	3 7.9	6 4 50.68	+26 58 19.3	13.5	13.1	0.98
7	3 8.0	6 8 52.62	26 58 2.9	13.6	13.3	0.99
8	3 8.0	6 12 51.82	26 57 15.0	13.8	13.4	1.00
9	3 8.0	6 16 48.12	26 55 56.1	14.0	13.6	1.01
10	3 8.0	6 20 41.39	26 54 6.6	14.2	13.7	1.02
11	3 7.9	6 24 31.48	+26 51 47.3	14.4	13.9	1.04
12	3 7.7	6 28 18.26	26 48 58.8	14.6	14.1	1.05
13	3 7.5	6 32 1.60	26 45 41.8	14.8	14.3	1.06
14	3 7.2	6 35 41.35	26 41 56.9	15.0	14.5	1.08
15	3 6.9	6 39 17.36	26 37 44.8	15.2	14.7	1.09
16	3 6.5	6 42 49.48	+26 33 6.2	15.4	14.9	1.11
17	3 6.0	6 46 17.57	+26 28 1.8	15.6	15.1	1.12

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
May 17	3 6.0	6 46 17.57	+26 28 1.8	15.6	15.1	1.12
18	3 5.5	6 49 41.45	26 22 32.4	15.8	15.3	1.14
19	3 4.9	6 53 1.00	26 16 38.8	16.1	15.5	1.15
20	3 4.2	6 56 16.06	26 10 21.8	16.3	15.7	1.17
21	3 3.4	6 59 26.47	26 3 42.2	16.5	15.9	1.18
22	3 2.6	7 2 32.05	+25 56 40.9	16.8	16.2	1.20
23	3 1.7	7 5 32.65	25 49 18.7	17.0	16.4	1.21
24	3 0.7	7 8 28.09	25 41 36.5	17.3	16.7	1.23
25	2 59.5	7 11 18.18	25 33 35.2	17.5	17.0	1.24
26	2 58.3	7 14 2.76	25 25 15.9	17.8	17.2	1.26
27	2 57.0	7 16 41.63	+25 16 39.4	18.0	17.5	1.28
28	2 55.6	7 19 14.56	25 7 46.8	18.3	17.7	1.30
29	2 54.1	7 21 41.37	24 58 39.0	18.6	18.0	1.32
30	2 52.5	7 24 1.81	24 49 17.0	18.9	18.3	1.34
31	2 50.8	7 26 15.68	24 39 41.9	19.2	18.6	1.36
June 1	2 49.0	7 28 22.75	+24 29 54.7	19.6	18.9	1.38
2	2 47.1	7 30 22.80	24 19 56.4	19.9	19.2	1.40
3	2 45.0	7 32 15.60	24 9 48.0	20.2	19.5	1.42
4	2 42.8	7 34 0.91	23 59 30.5	20.5	19.8	1.44
5	2 40.5	7 35 38.49	23 49 5.0	20.8	20.1	1.46
6	2 38.1	7 37 8.10	+23 38 32.4	21.2	20.4	1.48
7	2 35.5	7 38 29.51	23 27 53.7	21.5	20.8	1.50
8	2 32.8	7 39 42.50	23 17 9.8	21.9	21.1	1.53
9	2 29.9	7 40 46.81	23 6 21.7	22.2	21.5	1.55
10	2 26.9	7 41 42.21	22 55 30.3	22.6	21.8	1.58
11	2 23.7	7 42 28.50	+22 44 36.6	23.0	22.2	1.60
12	2 20.4	7 43 5.49	22 33 41.2	23.3	22.5	1.63
13	2 16.9	7 43 32.97	22 22 45.0	23.7	22.9	1.65
14	2 13.3	7 43 50.78	22 11 48.6	24.0	23.2	1.68
15	2 9.5	7 43 58.76	22 0 52.9	24.4	23.6	1.70
16	2 5.5	7 43 56.77	+21 49 58.5	24.8	24.0	1.72
17	2 1.4	7 43 44.72	21 39 6.0	25.2	24.3	1.75
18	1 57.1	7 43 22.54	21 28 16.0	25.6	24.7	1.77
19	1 52.7	7 42 50.19	21 17 29.1	25.9	25.0	1.80
20	1 48.1	7 42 7.69	21 6 45.8	26.3	25.4	1.82
21	1 43.2	7 41 15.04	+20 56 6.7	26.7	25.8	1.84
22	1 38.2	7 40 12.34	20 45 32.2	27.0	26.2	1.87
23	1 33.1	7 38 59.72	20 35 2.9	27.3	26.5	1.89
24	1 27.8	7 37 37.36	20 24 39.2	27.7	26.8	1.91
25	1 22.3	7 36 5.51	20 14 21.7	28.1	27.1	1.93
26	1 16.7	7 34 24.50	+20 4 10.9	28.4	27.4	1.95
27	1 10.9	7 32 34.70	19 54 7.3	28.7	27.7	1.97
28	1 5.0	7 30 36.56	19 44 11.6	29.0	28.0	1.99
29	0 59.0	7 28 30.57	19 34 24.1	29.3	28.3	2.01
30	0 52.9	7 26 17.36	19 24 45.7	29.5	28.5	2.03
July 1	0 46.7	7 23 57.54	+19 15 17.1	29.7	28.7	2.04
2	0 40.4	7 21 31.93	+19 5 59.1	29.9	28.8	2.05

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
July 1	0 46.7	7 23 57.54	+19 15 17.1	29.7	28.7	2.04
2	0 40.4	7 21 31.93	19 5 59.1	29.9	28.8	2.05
3	0 33.9	7 19 1.28	18 56 52.4	30.1	29.0	2.06
4	0 27.4	7 16 26.49	18 47 58.1	30.3	29.1	2.06
5	0 20.8	7 13 48.42	18 39 17.0	30.4	29.3	2.07
6	0 14.2	7 11 8.04	+18 30 50.2	30.4	29.3	2.07
7	0 7.5	7 8 26.33	18 22 38.8	30.4	29.4	2.07
8	0 0.9	7 5 44.29	18 14 44.0	30.5	29.4	2.07
8	23 54.3	7 3 2.97	18 7 7.0	30.5	29.4	2.06
9	23 47.7	7 0 23.32	17 59 48.9	30.5	29.4	2.06
10	23 41.2	6 57 46.26	+17 52 51.0	30.4	29.3	2.05
11	23 34.7	6 55 12.79	17 46 14.3	30.3	29.2	2.04
12	23 28.3	6 52 43.87	17 39 59.9	30.1	29.0	2.03
13	23 22.0	6 50 20.32	17 34 8.7	29.9	28.9	2.02
14	23 15.8	6 48 2.93	17 28 41.9	29.7	28.7	2.01
15	23 9.7	6 45 52.44	+17 23 40.1	29.4	28.4	1.99
16	23 3.7	6 43 49.48	17 19 4.0	29.2	28.2	1.97
17	22 57.9	6 41 54.60	17 14 54.0	28.9	27.9	1.95
18	22 52.2	6 40 8.29	17 11 10.4	28.7	27.7	1.93
19	22 46.7	6 38 30.96	17 7 53.3	28.4	27.4	1.91
20	22 41.3	6 37 2.95	+17 5 2.7	28.1	27.0	1.89
21	22 36.1	6 35 44.50	17 2 38.3	27.7	26.7	1.87
22	22 31.0	6 34 35.79	17 0 39.9	27.4	26.4	1.85
23	22 26.0	6 33 36.97	16 59 6.8	27.0	26.0	1.82
24	22 21.2	6 32 48.11	16 57 58.5	26.7	25.7	1.80
25	22 16.6	6 32 9.20	+16 57 14.0	26.3	25.4	1.77
26	22 12.3	6 31 40.24	16 56 52.4	25.9	25.0	1.74
27	22 8.1	6 31 21.21	16 56 52.5	25.5	24.7	1.72
28	22 4.0	6 31 11.96	16 57 13.2	25.1	24.3	1.69
29	22 0.0	6 31 12.37	16 57 53.1	24.8	24.0	1.67
30	21 56.2	6 31 22.33	+16 58 50.9	24.4	23.6	1.64
31	21 52.6	6 31 41.64	17 0 5.1	24.1	23.3	1.61
Aug. 1	21 49.2	6 32 10.14	17 1 34.4	23.7	22.9	1.59
2	21 45.9	6 32 47.62	17 3 17.1	23.4	22.6	1.56
3	21 42.7	6 33 33.88	17 5 11.6	23.0	22.2	1.54
4	21 39.7	6 34 28.70	+17 7 16.5	22.6	21.9	1.51
5	21 36.8	6 35 31.88	17 9 30.1	22.3	21.5	1.49
6	21 34.1	6 36 43.15	17 11 50.7	21.9	21.2	1.47
7	21 31.5	6 38 2.33	17 14 16.8	21.6	20.8	1.45
8	21 29.0	6 39 29.17	17 16 46.8	21.2	20.5	1.43
9	21 26.6	6 41 3.46	+17 19 19.1	20.9	20.2	1.40
10	21 24.4	6 42 44.98	17 21 52.2	20.6	19.9	1.38
11	21 22.3	6 44 33.49	17 24 24.6	20.3	19.6	1.36
12	21 20.3	6 46 28.76	17 26 54.8	20.0	19.3	1.34
13	21 18.3	6 48 30.58	17 29 21.3	19.6	19.0	1.32
14	21 16.5	6 50 38.71	+17 31 42.8	19.3	18.7	1.30
15	21 14.8	6 52 52.92	+17 33 57.8	19.0	18.4	1.28
Aug. 15	21 14.8	6 52 52.92	+17 33 57.8	19.0	18.4	1.28
16	21 13.2	6 55 13.02	17 36 5.1	18.7	18.1	1.26
17	21 11.7	6 57 38.79	17 38 3.4	18.4	17.9	1.24
18	21 10.3	7 0 9.99	17 39 51.5	18.2	17.6	1.23
19	21 9.0	7 2 46.42	17 41 28.2	17.9	17.4	1.21
20	21 7.7	7 5 27.87	+17 42 52.5	17.7	17.1	1.20
21	21 6.5	7 8 14.16	17 44 3.2	17.4	16.9	1.18
22	21 5.4	7 11 5.11	17 44 59.4	17.2	16.6	1.17
23	21 4.4	7 14 0.50	17 45 40.0	16.9	16.4	1.15
24	21 3.5	7 17 0.19	17 46 4.1	16.6	16.1	1.13
25	21 2.6	7 20 3.98	+17 46 10.7	16.4	15.9	1.12
26	21 1.8	7 23 11.72	17 45 59.0	16.2	15.7	1.10
27	21 1.0	7 26 23.25	17 45 28.2	16.0	15.5	1.09
28	21 0.3	7 29 38.43	17 44 37.4	15.8	15.3	1.07
29	20 59.7	7 32 57.10	17 43 25.9	15.6	15.1	1.06
30	20 59.1	7 36 19.10	+17 41 53.0	15.4	14.9	1.04
31	20 58.6	7 39 44.33	17 39 57.9	15.2	14.7	1.03
Sept. 1	20 58.1	7 43 12.63	17 37 40.1	15.0	14.5	1.01
2	20 57.7	7 46 43.88	17 34 58.9	14.8	14.3	1.00
3	20 57.4	7 50 17.95	17 31 53.7	14.6	14.1	0.98
4	20 57.1	7 53 54.73	+17 28 23.9	14.4	13.9	0.97
5	20 56.8	7 57 34.11	17 24 29.0	14.2	13.7	0.96
6	20 56.5	8 1 15.97	17 20 8.6	14.0	13.5	0.95
7	20 56.3	8 5 0.23	17 15 22.2	13.9	13.4	0.94
8	20 56.1	8 8 46.76	17 10 9.3	13.7	13.2	0.92
9	20 56.0	8 12 35.48	+17 4 29.6	13.6	13.1	0.91
10	20 55.9	8 16 26.27	16 58 22.8	13.4	12.9	0.90
11	20 55.9	8 20 19.03	16 51 48.7	13.3	12.8	0.89
12	20 55.8	8 24 13.66	16 44 46.9	13.1	12.7	0.88
13	20 55.8	8 28 10.08	16 37 17.2	13.0	12.5	0.87
14	20 55.9	8 32 8.19	+16 29 19.5	12.8	12.4	0.86
15	20 55.9	8 36 7.89	16 20 53.7	12.7	12.2	0.85
16	20 56.0	8 40 9.08	16 11 59.7	12.5	12.1	0.84
17	20 56.1	8 44 11.69	16 2 37.5	12.4	12.0	0.83
18	20 56.2	8 48 15.62	15 52 47.0	12.2	11.9	0.82
19	20 56.3	8 52 20.78	+15 42 28.2	12.1	11.8	0.81
20	20 56.5	8 56 27.11	15 31 41.2	12.0	11.7	0.80
21	20 56.7	9 0 34.54	15 20 26.0	11.9	11.6	0.79
22	20 56.9	9 4 42.99	15 8 42.7	11.8	11.4	0.78
23	20 57.1	9 8 52.39	14 56 31.5	11.6	11.3	0.77
24	20 57.3	9 13 2.68	+14 43 52.5	11.5	11.2	0.76
25	20 57.5	9 17 13.79	14 30 45.8	11.4	11.1	0.75
26	20 57.8	9 21 25.67	14 17 11.7	11.3	11.0	0.74
27	20 58.1	9 25 38.26	14 3 10.3	11.2	10.8	0.74
28	20 58.3	9 29 51.51	13 48 41.8	11.1	10.7	0.73
29	20 58.6	9 34 5.37	+13 33 46.3	11.0	10.6	0.72
30	20 58.9	9 38 19.80	+13 18 24.3	10.9	10.5	0.71

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Oct. 1	20 59.2	9 42 34.76	+13 2 36.0	10.8	10.4	0.70
2	20 59.5	9 46 50.20	12 46 21.8	10.7	10.4	0.70
3	20 59.9	9 51 6.09	12 29 41.9	10.6	10.3	0.69
4	21 0.2	9 55 22.42	12 12 36.6	10.5	10.2	0.69
5	21 0.5	9 59 39.15	11 55 6.2	10.4	10.1	0.68
6	21 0.9	10 3 56.23	+11 37 11.2	10.4	10.0	0.67
7	21 1.2	10 8 13.66	11 18 51.8	10.3	9.9	0.67
8	21 1.6	10 12 31.41	11 0 8.6	10.2	9.8	0.67
9	21 1.9	10 16 49.46	10 41 1.9	10.1	9.7	0.66
10	21 2.3	10 21 7.79	10 21 32.2	10.0	9.6	0.65
11	21 2.7	10 25 26.38	+10 1 40.0	9.9	9.5	0.64
12	21 3.0	10 29 45.20	9 41 25.7	9.8	9.5	0.64
13	21 3.4	10 34 4.26	9 20 49.9	9.8	9.4	0.64
14	21 3.8	10 38 23.53	8 59 53.1	9.7	9.3	0.63
15	21 4.2	10 42 42.99	8 38 35.8	9.6	9.3	0.63
16	21 4.5	10 47 2.63	+ 8 16 58.7	9.6	9.2	0.62
17	21 4.9	10 51 22.44	7 55 2.3	9.5	9.1	0.61
18	21 5.3	10 55 42.40	7 32 47.1	9.4	9.1	0.61
19	21 5.7	11 0 2.52	7 10 13.8	9.3	9.0	0.60
20	21 6.1	11 4 22.79	6 47 22.9	9.2	8.9	0.60
21	21 6.5	11 8 43.21	+ 6 24 15.1	9.1	8.9	0.59
22	21 6.9	11 13 3.76	6 0 51.0	9.1	8.8	0.59
23	21 7.3	11 17 24.45	5 37 11.2	9.0	8.7	0.59
24	21 7.7	11 21 45.30	5 13 16.3	8.9	8.7	0.58
25	21 8.1	11 26 6.31	4 49 7.0	8.9	8.6	0.58
26	21 8.5	11 30 27.48	+ 4 24 43.8	8.8	8.6	0.57
27	21 8.9	11 34 48.83	4 0 7.4	8.8	8.5	0.57
28	21 9.3	11 39 10.35	3 35 18.6	8.7	8.4	0.57
29	21 9.8	11 43 32.06	3 10 17.8	8.6	8.3	0.56
30	21 10.2	11 47 53.98	2 45 5.8	8.6	8.3	0.56
31	21 10.6	11 52 16.13	+ 2 19 43.2	8.5	8.2	0.55
Nov. 1	21 11.0	11 56 38.52	1 54 10.7	8.5	8.2	0.55
2	21 11.5	12 1 1.17	1 28 28.7	8.4	8.1	0.55
3	21 11.9	12 5 24.11	1 2 38.2	8.4	8.0	0.54
4	21 12.4	12 9 47.36	0 36 39.7	8.3	8.0	0.54
5	21 12.8	12 14 10.92	+ 0 10 33.9	8.3	7.9	0.53
6	21 13.3	12 18 34.85	− 0 15 38.4	8.2	7.9	0.53
7	21 13.7	12 22 59.16	0 41 56.7	8.2	7.9	0.53
8	21 14.2	12 27 23.87	1 8 20.3	8.1	7.8	0.52
9	21 14.7	12 31 49.02	1 34 48.4	8.1	7.8	0.52
10	21 15.1	12 36 14.62	− 2 1 20.2	8.0	7.7	0.51
11	21 15.6	12 40 40.70	2 27 55.0	8.0	7.7	0.51
12	21 16.1	12 45 7.28	2 54 32.1	7.9	7.7	0.51
13	21 16.6	12 49 34.38	3 21 10.7	7.9	7.6	0.51
14	21 17.2	12 54 2.02	3 47 50.1	7.8	7.6	0.51
15	21 17.7	12 58 30.24	− 4 14 29.5	7.8	7.5	0.50
16	21 18.2	13 2 59.05	− 4 41 8.1	7.7	7.5	0.50
Nov. 16	21 18.2	13 2 59.05	− 4 41 8.1	7.7	7.5	0.50
17	21 18.8	13 7 28.47	5 7 45.2	7.6	7.5	0.50
18	21 19.3	13 11 58.54	5 34 20.0	7.6	7.4	0.50
19	21 19.9	13 16 29.27	6 0 51.8	7.6	7.4	0.49
20	21 20.5	13 21 0.69	6 27 19.8	7.5	7.3	0.49
21	21 21.1	13 25 32.85	− 6 53 43.2	7.5	7.3	0.49
22	21 21.7	13 30 5.73	7 20 1.2	7.5	7.3	0.49
23	21 22.3	13 34 39.38	7 46 13.0	7.4	7.2	0.49
24	21 22.9	13 39 13.81	8 12 17.8	7.4	7.2	0.48
25	21 23.6	13 43 49.06	8 38 14.9	7.4	7.1	0.48
26	21 24.2	13 48 25.15	− 9 4 3.5	7.3	7.1	0.48
27	21 24.9	13 53 2.10	9 29 42.8	7.3	7.1	0.48
28	21 25.6	13 57 39.96	9 55 12.1	7.3	7.0	0.48
29	21 26.3	14 2 18.72	10 20 30.6	7.3	7.0	0.48
30	21 27.0	14 6 58.42	10 45 37.5	7.2	6.9	0.47
Dec. 1	21 27.7	14 11 39.10	−11 10 32.0	7.2	6.9	0.47
2	21 28.5	14 16 20.78	11 35 13.3	7.2	6.9	0.47
3	21 29.3	14 21 3.48	11 59 40.6	7.1	6.9	0.47
4	21 30.0	14 25 47.22	12 23 53.2	7.1	6.8	0.47
5	21 30.8	14 30 32.02	12 47 50.2	7.1	6.8	0.46
6	21 31.7	14 35 17.92	−13 11 30.9	7.0	6.8	0.46
7	21 32.5	14 40 4.92	13 34 54.4	6.9	6.7	0.46
8	21 33.4	14 44 53.06	13 58 0.0	6.9	6.7	0.46
9	21 34.3	14 49 42.35	14 20 46.8	6.9	6.7	0.46
10	21 35.2	14 54 32.80	14 43 14.1	6.9	6.6	0.46
11	21 36.1	14 59 24.42	−15 5 21.0	6.8	6.6	0.46
12	21 37.0	15 4 17.22	15 27 6.7	6.8	6.6	0.46
13	21 37.9	15 9 11.22	15 48 30.4	6.8	6.6	0.46
14	21 38.9	15 14 6.39	16 9 31.3	6.7	6.5	0.45
15	21 39.9	15 19 2.77	16 30 8.6	6.7	6.5	0.45
16	21 41.0	15 24 0.36	−16 50 21.5	6.7	6.5	0.45
17	21 42.0	15 28 59.15	17 10 9.2	6.7	6.5	0.45
18	21 43.1	15 33 59.14	17 29 31.0	6.6	6.4	0.45
19	21 44.1	15 39 0.32	17 48 26.1	6.6	6.4	0.45
20	21 45.2	15 44 2.70	18 6 53.7	6.6	6.3	0.45
21	21 46.3	15 49 6.24	−18 24 53.1	6.6	6.3	0.45
22	21 47.4	15 54 10.96	18 42 23.6	6.5	6.3	0.45
23	21 48.6	15 59 16.83	18 59 24.3	6.5	6.3	0.45
24	21 49.7	16 4 23.85	19 15 54.6	6.5	6.2	0.44
25	21 50.9	16 9 32.00	19 31 53.8	6.5	6.2	0.44
26	21 52.1	16 14 41.24	−19 47 21.2	6.4	6.2	0.44
27	21 53.3	16 19 51.56	20 2 16.0	6.4	6.2	0.44
28	21 54.6	16 25 2.95	20 16 37.8	6.4	6.2	0.44
29	21 55.9	16 30 15.40	20 30 25.9	6.4	6.1	0.44
30	21 57.1	16 35 28.88	20 43 39.5	6.3	6.1	0.44
31	21 58.4	16 40 43.30	−20 56 18.1	6.3	6.1	0.44
32	21 59.7	16 45 58.71	−21 8 21.2	6.3	6.1	0.44

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	19 40.7	8 23 50.53	+20 27 38.2	5.2	3.0	0.21	Nov. 16	18 17.1	10 1 18.38	+14 13 11.9	6.6	3.8	0.26
2	19 39.2	8 26 15.55	20 20 26.3	5.2	3.0	0.21	17	18 14.9	10 3 4.02	14 5 11.7	6.6	3.9	0.26
3	19 37.7	8 28 39.86	20 13 9.3	5.2	3.0	0.22	18	18 12.7	10 4 48.56	13 57 15.2	6.7	3.9	0.27
4	19 36.1	8 31 3.46	20 5 47.4	5.2	3.0	0.22	19	18 10.5	10 6 31.98	13 49 22.5	6.7	3.9	0.27
5	19 34.6	8 33 26.35	19 58 20.7	5.3	3.0	0.22	20	18 8.2	10 8 14.27	13 41 34.0	6.7	3.9	0.27
6	19 33.0	8 35 48.52	+19 50 49.4	5.3	3.0	0.22	21	18 6.0	10 9 55.42	+13 33 49.8	6.8	3.9	0.27
7	19 31.4	8 38 9.96	19 43 13.7	5.3	3.0	0.22	22	18 3.7	10 11 35.40	13 26 10.2	6.8	3.9	0.27
8	19 29.8	8 40 30.68	19 35 33.7	5.3	3.1	0.22	23	18 1.4	10 13 14.19	13 18 35.4	6.9	3.9	0.28
9	19 28.2	8 42 50.68	19 27 49.5	5.4	3.1	0.22	24	17 59.1	10 14 51.78	13 11 5.5	6.9	4.0	0.28
10	19 26.6	8 45 9.94	19 20 1.4	5.4	3.1	0.22	25	17 56.8	10 16 28.15	13 3 40.9	7.0	4.0	0.28
11	19 25.0	8 47 28.47	+19 12 9.4	5.5	3.1	0.22	26	17 54.4	10 18 3.29	+12 56 21.7	7.1	4.0	0.28
12	19 23.3	8 49 46.25	19 4 14.0	5.5	3.1	0.22	27	17 52.1	10 19 37.18	12 49 8.1	7.1	4.1	0.28
13	19 21.7	8 52 3.28	18 56 15.3	5.5	3.2	0.22	28	17 49.7	10 21 9.80	12 42 0.4	7.2	4.1	0.28
14	19 20.0	8 54 19.55	18 48 13.2	5.5	3.2	0.22	29	17 47.3	10 22 41.14	12 34 58.8	7.2	4.1	0.29
15	19 18.3	8 56 35.05	18 40 8.1	5.6	3.2	0.22	30	17 44.8	10 24 11.18	12 28 3.5	7.2	4.2	0.29
16	19 16.6	8 58 49.77	+18 32 0.0	5.6	3.2	0.22	Dec. 1	17 42.4	10 25 39.89	+12 21 14.7	7.3	4.2	0.29
17	19 14.9	9 1 3.70	18 23 49.3	5.6	3.2	0.22	2	17 39.9	10 27 7.27	12 14 32.5	7.3	4.2	0.29
18	19 13.2	9 3 16.83	18 15 36.2	5.6	3.3	0.22	3	17 37.4	10 28 33.29	12 7 57.4	7.4	4.3	0.29
19	19 11.5	9 5 29.16	18 7 20.8	5.6	3.3	0.22	4	17 34.9	10 29 57.93	12 1 29.6	7.4	4.3	0.30
20	19 9.7	9 7 40.67	17 59 3.3	5.7	3.3	0.23	5	17 32.3	10 31 21.17	11 55 9.3	7.5	4.3	0.30
21	19 8.0	9 9 51.37	+17 50 43.9	5.7	3.3	0.23	6	17 29.7	10 32 42.98	+11 48 56.7	7.6	4.3	0.30
22	19 6.2	9 12 1.24	17 42 22.8	5.7	3.3	0.23	7	17 27.1	10 34 3.33	11 42 52.1	7.6	4.4	0.31
23	19 4.4	9 14 10.27	17 34 0.2	5.8	3.3	0.23	8	17 24.5	10 35 22.21	11 36 55.8	7.7	4.4	0.31
24	19 2.6	9 16 18.46	17 25 36.3	5.8	3.3	0.23	9	17 21.9	10 36 39.56	11 31 8.1	7.7	4.4	0.31
25	19 0.8	9 18 25.80	17 17 11.3	5.8	3.3	0.23	10	17 19.2	10 37 55.36	11 25 29.3	7.8	4.5	0.31
26	18 59.0	9 20 32.30	+17 8 45.3	5.9	3.3	0.24	11	17 16.5	10 39 9.58	+11 19 59.6	7.9	4.5	0.31
27	18 57.1	9 22 37.92	17 0 18.3	5.9	3.4	0.24	12	17 13.8	10 40 22.20	11 14 39.3	7.9	4.5	0.32
28	18 55.2	9 24 42.67	16 51 50.7	5.9	3.4	0.24	13	17 11.0	10 41 33.18	11 9 28.9	8.0	4.6	0.32
29	18 53.4	9 26 46.55	16 43 22.7	5.9	3.4	0.24	14	17 8.2	10 42 42.48	11 4 28.6	8.0	4.6	0.32
30	18 51.5	9 28 49.54	16 34 54.4	6.0	3.4	0.24	15	17 5.4	10 43 50.05	10 59 38.7	8.1	4.6	0.32
31	18 49.6	9 30 51.65	+16 26 26.0	6.0	3.4	0.24	16	17 2.6	10 44 55.88	+10 54 59.4	8.2	4.7	0.32
Nov. 1	18 47.7	9 32 52.86	16 17 57.7	6.0	3.4	0.25	17	16 59.7	10 45 59.92	10 50 30.9	8.3	4.7	0.32
2	18 45.7	9 34 53.17	16 9 29.7	6.0	3.5	0.25	18	16 56.8	10 47 2.14	10 46 13.6	8.3	4.8	0.33
3	18 43.8	9 36 52.58	16 1 2.1	6.1	3.5	0.25	19	16 53.9	10 48 2.49	10 42 7.7	8.4	4.8	0.33
4	18 41.8	9 38 51.08	15 52 35.1	6.1	3.5	0.25	20	16 50.9	10 49 0.94	10 38 13.5	8.5	4.9	0.33
5	18 39.9	9 40 48.66	+15 44 8.8	6.2	3.6	0.25	21	16 47.9	10 49 57.46	+10 34 31.4	8.6	4.9	0.33
6	18 37.9	9 42 45.31	15 35 43.5	6.2	3.6	0.25	22	16 44.9	10 50 52.02	10 31 1.6	8.6	4.9	0.34
7	18 35.9	9 44 41.04	15 27 19.4	6.2	3.7	0.25	23	16 41.9	10 51 44.57	10 27 44.4	8.7	5.0	0.34
8	18 33.8	9 46 35.82	15 18 56.7	6.3	3.7	0.25	24	16 38.8	10 52 35.07	10 24 40.0	8.8	5.0	0.34
9	18 31.8	9 48 29.64	15 10 35.6	6.3	3.7	0.25	25	16 35.6	10 53 23.48	10 21 48.7	8.9	5.0	0.34
10	18 29.7	9 50 22.48	+15 2 16.3	6.4	3.7	0.26	26	16 32.5	10 54 9.78	+10 19 10.7	9.0	5.1	0.35
11	18 27.7	9 52 14.35	14 53 59.1	6.4	3.7	0.26	27	16 29.3	10 54 53.94	10 16 46.2	9.0	5.1	0.35
12	18 25.6	9 54 5.22	14 45 44.2	6.4	3.8	0.26	28	16 26.0	10 55 35.91	10 14 35.4	9.1	5.2	0.35
13	18 23.5	9 55 55.07	14 37 31.8	6.5	3.8	0.26	29	16 22.8	10 56 15.66	10 12 38.7	9.2	5.2	0.35
14	18 21.4	9 57 43.89	14 29 22.1	6.5	3.8	0.26	30	16 19.5	10 56 53.15	10 10 56.2	9.3	5.3	0.36
15	18 19.2	9 59 31.67	+14 21 15.4	6.6	3.8	0.26	31	16 16.1	10 57 28.35	+10 9 28.3	9.4	5.3	0.36
16	18 17.1	10 1 18.38	+14 13 11.9	6.6	3.8	0.26	32	16 12.7	10 58 1.22	+10 8 15.1	9.5	5.4	0.36

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Mar. 1	17 54.3	16 33 27.71	−21 5 16.5	1.7	17.9	1.36	Apr. 16	14 55.0	16 34 57.67	−21 5 24.2	1.9	20.5	1.56
2	17 50.7	16 33 46.82	21 5 51.6	1.7	17.9	1.36	17	14 50.8	16 34 41.61	21 4 49.6	1.9	20.5	1.56
3	17 47.1	16 34 5.22	21 6 25.1	1.7	18.0	1.37	18	14 46.5	16 34 24.87	21 4 13.5	1.9	20.6	1.57
4	17 43.4	16 34 22.90	21 6 56.9	1.7	18.0	1.37	19	14 42.3	16 34 7.44	21 3 36.0	1.9	20.6	1.57
5	17 39.8	16 34 39.86	21 7 27.1	1.7	18.1	1.38	20	14 38.1	16 33 49.30	21 2 57.2	2.0	20.7	1.58
6	17 36.2	16 34 56.08	−21 7 55.7	1.7	18.2	1.38	21	14 33.9	16 33 30.49	−21 2 17.0	2.0	20.7	1.58
7	17 32.5	16 35 11.58	21 8 22.7	1.7	18.2	1.39	22	14 29.6	16 33 11.04	21 1 35.5	2.0	20.8	1.58
8	17 28.8	16 35 26.33	21 8 48.2	1.7	18.3	1.39	23	14 25.3	16 32 50.94	21 0 52.6	2.0	20.8	1.59
9	17 25.1	16 35 40.34	21 9 12.0	1.7	18.3	1.40	24	14 21.0	16 32 30.19	21 0 8.4	2.0	20.9	1.59
10	17 21.4	16 35 53.61	21 9 34.3	1.7	18.4	1.40	25	14 16.8	16 32 8.81	20 59 22.9	2.0	20.9	1.59
11	17 17.7	16 36 6.13	−21 9 55.0	1.8	18.4	1.40	26	14 12.5	16 31 46.80	−20 58 36.1	2.0	21.0	1.59
12	17 13.9	16 36 17.89	21 10 14.2	1.8	18.5	1.41	27	14 8.2	16 31 24.18	20 57 47.9	2.0	21.0	1.60
13	17 10.2	16 36 28.89	21 10 31.8	1.8	18.5	1.41	28	14 3.8	16 31 0.99	20 56 58.5	2.0	21.0	1.60
14	17 6.4	16 36 39.14	21 10 47.8	1.8	18.6	1.42	29	13 59.5	16 30 37.23	20 56 7.9	2.0	21.1	1.60
15	17 2.6	16 36 48.62	21 11 2.2	1.8	18.7	1.42	30	13 55.2	16 30 12.92	20 55 16.1	2.0	21.1	1.60
16	16 58.8	16 36 57.33	−21 11 15.1	1.8	18.7	1.43	May 1	13 50.9	16 29 48.08	−20 54 23.0	2.0	21.2	1.61
17	16 55.0	16 37 5.26	21 11 26.4	1.8	18.8	1.43	2	13 46.5	16 29 22.70	20 53 28.8	2.0	21.2	1.61
18	16 51.2	16 37 12.43	21 11 36.1	1.8	18.8	1.44	3	13 42.2	16 28 56.83	20 52 33.5	2.0	21.2	1.61
19	16 47.4	16 37 18.82	21 11 44.3	1.8	18.9	1.44	4	13 37.8	16 28 30.47	20 51 37.1	2.0	21.3	1.61
20	16 43.6	16 37 24.41	21 11 51.0	1.8	18.9	1.45	5	13 33.4	16 28 3.64	20 50 39.5	2.0	21.3	1.62
21	16 39.7	16 37 29.22	−21 11 56.1	1.8	19.0	1.45	6	13 29.0	16 27 36.36	−20 49 40.9	2.0	21.4	1.62
22	16 35.8	16 37 33.24	21 11 59.7	1.8	19.0	1.46	7	13 24.6	16 27 8.65	20 48 41.3	2.0	21.4	1.62
23	16 32.0	16 37 36.47	21 12 1.8	1.8	19.1	1.46	8	13 20.2	16 26 40.54	20 47 40.7	2.0	21.4	1.62
24	16 28.1	16 37 38.90	21 12 2.4	1.8	19.1	1.46	9	13 15.8	16 26 12.04	20 46 39.0	2.0	21.5	1.63
25	16 24.2	16 37 40.54	21 12 1.4	1.8	19.2	1.47	10	13 11.4	16 25 43.17	20 45 36.4	2.0	21.5	1.63
26	16 20.3	16 37 41.38	−21 11 59.0	1.8	19.2	1.47	11	13 7.0	16 25 13.93	−20 44 32.9	2.0	21.5	1.63
27	16 16.3	16 37 41.41	21 11 55.1	1.8	19.3	1.48	12	13 2.5	16 24 44.36	20 43 28.5	2.0	21.6	1.63
28	16 12.4	16 37 40.65	21 11 49.6	1.8	19.3	1.48	13	12 58.1	16 24 14.47	20 42 23.2	2.0	21.6	1.63
29	16 8.4	16 37 39.08	21 11 42.6	1.8	19.4	1.48	14	12 53.7	16 23 44.28	20 41 17.1	2.0	21.6	1.63
30	16 4.4	16 37 36.72	21 11 34.1	1.8	19.4	1.49	15	12 49.2	16 23 13.82	20 40 10.3	2.0	21.6	1.63
31	16 0.5	16 37 33.55	−21 11 24.1	1.8	19.5	1.49	16	12 44.8	16 22 43.11	−20 39 2.8	2.0	21.7	1.64
Apr. 1	15 56.5	16 37 29.60	21 11 12.6	1.8	19.6	1.49	17	12 40.4	16 22 12.16	20 37 54.6	2.0	21.7	1.64
2	15 52.5	16 37 24.86	21 10 59.6	1.8	19.7	1.50	18	12 35.9	16 21 40.99	20 36 45.7	2.0	21.7	1.64
3	15 48.4	16 37 19.32	21 10 45.1	1.8	19.7	1.50	19	12 31.5	16 21 9.62	20 35 36.2	2.0	21.7	1.64
4	15 44.4	16 37 13.00	21 10 29.1	1.9	19.8	1.51	20	12 27.0	16 20 38.08	20 34 26.1	2.0	21.7	1.64
5	15 40.3	16 37 5.90	−21 10 11.6	1.9	19.9	1.51	21	12 22.5	16 20 6.38	−20 33 15.4	2.0	21.7	1.64
6	15 36.3	16 36 58.02	21 9 52.7	1.9	20.0	1.52	22	12 18.1	16 19 34.55	20 32 4.3	2.0	21.8	1.64
7	15 32.2	16 36 49.36	21 9 32.4	1.9	20.0	1.52	23	12 13.6	16 19 2.62	20 30 52.8	2.0	21.8	1.64
8	15 28.1	16 36 39.93	21 9 10.6	1.9	20.1	1.53	24	12 9.1	16 18 30.60	20 29 41.0	2.0	21.8	1.65
9	15 24.0	16 36 29.75	21 8 47.3	1.9	20.1	1.53	25	12 4.7	16 17 58.52	20 28 28.9	2.0	21.8	1.65
10	15 19.9	16 36 18.82	−21 8 22.6	1.9	20.2	1.53	26	12 0.2	16 17 26.40	−20 27 16.6	2.0	21.8	1.65
11	15 15.7	16 36 7.14	21 7 56.4	1.9	20.2	1.54	27	11 55.7	16 16 54.26	20 26 4.0	2.0	21.8	1.65
12	15 11.6	16 35 54.71	21 7 28.8	1.9	20.3	1.54	28	11 51.3	16 16 22.12	20 24 51.3	2.0	21.8	1.65
13	15 7.5	16 35 41.54	21 6 59.8	1.9	20.3	1.55	29	11 46.8	16 15 50.02	20 23 38.4	2.0	21.8	1.64
14	15 3.3	16 35 27.64	21 6 29.4	1.9	20.4	1.55	30	11 42.3	16 15 17.97	20 22 25.5	2.0	21.8	1.64
15	14 59.1	16 35 13.02	−21 5 57.5	1.9	20.4	1.56	31	11 37.9	16 14 45.99	−20 21 12.7	2.0	21.7	1.64
16	14 55.0	16 34 57.67	−21 5 24.2	1.9	20.5	1.56	June 1	11 33.4	16 14 14.11	−20 19 59.9	2.0	21.7	1.64

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
June 1	11 33.4	16 14 14.11	−20 19 59.9	2.0	21.7	1.64
2	11 29.0	16 13 42.37	20 18 47.2	2.0	21.7	1.64
3	11 24.5	16 13 10.78	20 17 34.7	2.0	21.7	1.64
4	11 20.1	16 12 39.35	20 16 22.4	2.0	21.7	1.64
5	11 15.6	16 12 8.10	20 15 10.5	2.0	21.7	1.64
6	11 11.2	16 11 37.05	−20 13 58.9	2.0	21.7	1.64
7	11 6.7	16 11 6.24	20 12 47.6	2.0	21.7	1.64
8	11 2.3	16 10 35.68	20 11 36.9	2.0	21.6	1.64
9	10 57.8	16 10 5.39	20 10 26.8	2.0	21.6	1.63
10	10 53.4	16 9 35.40	20 9 17.4	2.0	21.6	1.63
11	10 49.0	16 9 5.71	−20 8 8.5	2.0	21.6	1.63
12	10 44.6	16 8 36.34	20 7 0.4	2.0	21.6	1.63
13	10 40.2	16 8 7.32	20 5 53.0	2.0	21.5	1.63
14	10 35.8	16 7 38.66	20 4 46.4	2.0	21.5	1.63
15	10 31.4	16 7 10.37	20 3 40.6	2.0	21.5	1.63
16	10 27.0	16 6 42.48	−20 2 35.8	2.0	21.5	1.62
17	10 22.6	16 6 15.00	20 1 32.1	2.0	21.4	1.62
18	10 18.2	16 5 47.95	20 0 29.4	2.0	21.4	1.62
19	10 13.8	16 5 21.35	19 59 27.9	2.0	21.4	1.62
20	10 9.5	16 4 55.22	19 58 27.6	2.0	21.4	1.62
21	10 5.1	16 4 29.57	−19 57 28.4	2.0	21.4	1.61
22	10 0.7	16 4 4.41	19 56 30.5	2.0	21.3	1.61
23	9 56.4	16 3 39.77	19 55 33.9	2.0	21.3	1.61
24	9 52.1	16 3 15.66	19 54 38.8	2.0	21.2	1.60
25	9 47.8	16 2 52.09	19 53 45.1	2.0	21.2	1.60
26	9 43.4	16 2 29.08	−19 52 52.8	2.0	21.1	1.60
27	9 39.1	16 2 6.64	19 52 2.0	2.0	21.1	1.60
28	9 34.8	16 1 44.80	19 51 12.9	2.0	21.1	1.59
29	9 30.6	16 1 23.56	19 50 25.3	2.0	21.0	1.59
30	9 26.3	16 1 2.94	19 49 39.3	2.0	21.0	1.58
July 1	9 22.0	16 0 42.93	−19 48 55.1	2.0	20.9	1.58
2	9 17.8	16 0 23.56	19 48 12.7	2.0	20.9	1.58
3	9 13.5	16 0 4.83	19 47 32.1	2.0	20.9	1.57
4	9 9.3	15 59 46.76	19 46 53.4	2.0	20.8	1.57
5	9 5.1	15 59 29.36	19 46 16.6	2.0	20.8	1.57
6	9 0.8	15 59 12.63	−19 45 41.6	2.0	20.7	1.57
7	8 56.6	15 58 56.58	19 45 8.5	2.0	20.7	1.56
8	8 52.5	15 58 41.21	19 44 37.3	2.0	20.6	1.56
9	8 48.3	15 58 26.54	19 44 8.1	1.9	20.6	1.56
10	8 44.1	15 58 12.56	19 43 41.0	1.9	20.5	1.55
11	8 40.0	15 57 59.29	−19 43 16.0	1.9	20.5	1.55
12	8 35.8	15 57 46.74	19 42 53.1	1.9	20.4	1.54
13	8 31.7	15 57 34.90	19 42 32.1	1.9	20.4	1.54
14	8 27.6	15 57 23.76	19 42 13.3	1.9	20.3	1.54
15	8 23.5	15 57 13.36	19 41 56.6	1.9	20.3	1.53
16	8 19.4	15 57 3.70	−19 41 42.0	1.9	20.2	1.53
17	8 15.3	15 56 54.77	−19 41 29.6	1.9	20.2	1.53
July 17	8 15.3	15 56 54.77	−19 41 29.6	1.9	20.2	1.53
18	8 11.2	15 56 46.57	19 41 19.4	1.9	20.1	1.52
19	8 7.2	15 56 39.12	19 41 11.3	1.9	20.1	1.52
20	8 3.1	15 56 32.41	19 41 5.5	1.9	20.0	1.51
21	7 59.1	15 56 26.46	19 41 1.9	1.9	20.0	1.51
22	7 55.1	15 56 21.26	−19 41 0.5	1.9	19.9	1.51
23	7 51.1	15 56 16.81	19 41 1.4	1.9	19.8	1.50
24	7 47.1	15 56 13.12	19 41 4.5	1.9	19.8	1.50
25	7 43.1	15 56 10.20	19 41 9.8	1.8	19.7	1.49
26	7 39.1	15 56 8.04	19 41 17.4	1.8	19.6	1.49
27	7 35.2	15 56 6.64	−19 41 27.2	1.8	19.6	1.49
28	7 31.2	15 56 6.01	19 41 39.2	1.8	19.5	1.48
29	7 27.3	15 56 6.15	19 41 53.5	1.8	19.5	1.48
30	7 23.4	15 56 7.05	19 42 10.0	1.8	19.4	1.48
31	7 19.5	15 56 8.71	19 42 28.7	1.8	19.4	1.47
Aug. 1	7 15.6	15 56 11.13	−19 42 49.7	1.8	19.3	1.47
2	7 11.7	15 56 14.31	19 43 12.9	1.8	19.3	1.46
3	7 7.8	15 56 18.25	19 43 38.2	1.8	19.2	1.46
4	7 4.0	15 56 22.96	19 44 5.8	1.8	19.2	1.45
5	7 0.1	15 56 28.42	19 44 35.6	1.8	19.1	1.45
6	6 56.3	15 56 34.63	−19 45 7.5	1.8	19.1	1.44
7	6 52.5	15 56 41.58	19 45 41.6	1.8	19.0	1.44
8	6 48.7	15 56 49.28	19 46 17.7	1.8	19.0	1.43
9	6 44.9	15 56 57.71	19 46 55.9	1.8	18.9	1.43
10	6 41.1	15 57 6.88	19 47 36.3	1.8	18.9	1.43
11	6 37.4	15 57 16.78	−19 48 18.8	1.8	18.8	1.42
12	6 33.6	15 57 27.41	19 49 3.3	1.8	18.8	1.42
13	6 29.9	15 57 38.76	19 49 49.7	1.8	18.7	1.41
14	6 26.1	15 57 50.84	19 50 38.1	1.8	18.7	1.41
15	6 22.4	15 58 3.64	19 51 28.6	1.8	18.6	1.41
16	6 18.7	15 58 17.15	−19 52 21.0	1.8	18.6	1.40
17	6 15.0	15 58 31.38	19 53 15.5	1.8	18.5	1.40
18	6 11.3	15 58 46.34	19 54 11.9	1.7	18.4	1.39
19	6 7.6	15 59 2.00	19 55 10.1	1.7	18.4	1.39
20	6 4.0	15 59 18.35	19 56 10.1	1.7	18.3	1.39
21	6 0.3	15 59 35.40	−19 57 12.1	1.7	18.2	1.38
22	5 56.7	15 59 53.16	19 58 15.9	1.7	18.2	1.38
23	5 53.1	16 0 11.60	19 59 21.5	1.7	18.1	1.38
24	5 49.5	16 0 30.72	20 0 28.9	1.7	18.1	1.37
25	5 45.9	16 0 50.54	20 1 37.9	1.7	18.0	1.37
26	5 42.3	16 1 11.03	−20 2 48.6	1.7	18.0	1.36
27	5 38.7	16 1 32.20	20 4 0.9	1.7	17.9	1.36
28	5 35.1	16 1 54.04	20 5 14.8	1.7	17.9	1.36
29	5 31.6	16 2 16.53	20 6 30.4	1.7	17.8	1.35
30	5 28.0	16 2 39.68	20 7 47.7	1.7	17.8	1.35
31	5 24.5	16 3 3.48	−20 9 6.4	1.7	17.8	1.35
32	5 21.0	16 3 27.92	−20 10 26.5	1.7	17.7	1.34

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Mar. 22	18 18.1	18 20 6.16	−22 21 45.2	0.9	7.8	0.60
23	18 14.3	18 20 15.15	22 21 39.1	0.9	7.8	0.60
24	18 10.5	18 20 23.73	22 21 33.2	0.9	7.8	0.60
25	18 6.7	18 20 31.90	22 21 27.5	0.9	7.8	0.60
26	18 2.9	18 20 39.66	22 21 21.9	0.9	7.8	0.60
27	17 59.1	18 20 46.99	−22 21 16.5	0.9	7.9	0.60
28	17 55.3	18 20 53.91	22 21 11.3	0.9	7.9	0.61
29	17 51.5	18 21 0.42	22 21 6.3	0.9	7.9	0.61
30	17 47.7	18 21 6.50	22 21 1.4	0.9	7.9	0.61
31	17 43.8	18 21 12.15	22 20 56.8	0.9	7.9	0.61
Apr. 1	17 40.0	18 21 17.38	−22 20 52.4	0.9	7.9	0.61
2	17 36.1	18 21 22.20	22 20 48.2	0.9	7.9	0.61
3	17 32.3	18 21 26.59	22 20 44.2	0.9	7.9	0.61
4	17 28.4	18 21 30.55	22 20 40.5	0.9	7.9	0.61
5	17 24.5	18 21 34.10	22 20 37.0	0.9	8.0	0.62
6	17 20.7	18 21 37.22	−22 20 33.7	0.9	8.0	0.62
7	17 16.8	18 21 39.92	22 20 30.7	0.9	8.0	0.62
8	17 12.9	18 21 42.19	22 20 27.8	0.9	8.0	0.62
9	17 9.0	18 21 44.03	22 20 25.1	0.9	8.0	0.62
10	17 5.1	18 21 45.46	22 20 22.8	0.9	8.0	0.62
11	17 1.2	18 21 46.46	−22 20 20.7	0.9	8.0	0.62
12	16 57.2	18 21 47.04	22 20 18.8	0.9	8.0	0.62
13	16 53.3	18 21 47.20	22 20 17.2	0.9	8.1	0.62
14	16 49.4	18 21 46.94	22 20 15.8	0.9	8.1	0.62
15	16 45.4	18 21 46.26	22 20 14.7	0.9	8.1	0.62
16	16 41.5	18 21 45.16	−22 20 13.9	0.9	8.1	0.62
17	16 37.5	18 21 43.64	22 20 13.3	0.9	8.1	0.62
18	16 33.6	18 21 41.70	22 20 12.9	0.9	8.1	0.62
19	16 29.6	18 21 39.34	22 20 12.8	0.9	8.1	0.63
20	16 25.7	18 21 36.57	22 20 12.9	0.9	8.1	0.63
21	16 21.7	18 21 33.38	−22 20 13.3	0.9	8.2	0.63
22	16 17.7	18 21 29.77	22 20 14.1	0.9	8.2	0.63
23	16 13.6	18 21 25.76	22 20 15.1	0.9	8.2	0.63
24	16 9.6	18 21 21.33	22 20 16.3	0.9	8.2	0.63
25	16 5.6	18 21 16.49	22 20 17.8	0.9	8.2	0.63
26	16 1.6	18 21 11.25	−22 20 19.5	0.9	8.2	0.63
27	15 57.6	18 21 5.60	22 20 21.5	0.9	8.2	0.63
28	15 53.6	18 20 59.55	22 20 23.7	0.9	8.2	0.63
29	15 49.5	18 20 53.10	22 20 26.2	0.9	8.3	0.64
30	15 45.5	18 20 46.26	22 20 28.9	0.9	8.3	0.64
May 1	15 41.4	18 20 39.03	−22 20 31.8	0.9	8.3	0.64
2	15 37.4	18 20 31.40	22 20 35.0	0.9	8.3	0.64
3	15 33.3	18 20 23.39	22 20 38.4	0.9	8.3	0.64
4	15 29.2	18 20 15.02	22 20 42.0	0.9	8.3	0.64
5	15 25.1	18 20 6.27	22 20 45.9	0.9	8.3	0.64
6	15 21.0	18 19 57.15	−22 20 50.0	0.9	8.3	0.65
7	15 17.0	18 19 47.67	−22 20 54.3	0.9	8.4	0.65
May 6	15 21.0	18 19 57.15	−22 20 50.0	0.9	8.3	0.65
7	15 17.0	18 19 47.67	22 20 54.3	0.9	8.4	0.65
8	15 12.9	18 19 37.82	22 20 58.8	0.9	8.4	0.65
9	15 8.8	18 19 27.61	22 21 3.5	0.9	8.4	0.65
10	15 4.7	18 19 17.05	22 21 8.5	0.9	8.4	0.65
11	15 0.5	18 19 6.16	−22 21 13.7	0.9	8.4	0.65
12	14 56.4	18 18 54.93	22 21 19.0	0.9	8.4	0.65
13	14 52.3	18 18 43.36	22 21 24.4	0.9	8.4	0.65
14	14 48.2	18 18 31.46	22 21 30.0	1.0	8.4	0.65
15	14 44.0	18 18 19.24	22 21 35.8	1.0	8.5	0.65
16	14 39.9	18 18 6.69	−22 21 41.8	1.0	8.5	0.65
17	14 35.7	18 17 53.82	22 21 48.0	1.0	8.5	0.65
18	14 31.6	18 17 40.65	22 21 54.4	1.0	8.5	0.65
19	14 27.4	18 17 27.18	22 22 0.9	1.0	8.5	0.65
20	14 23.3	18 17 13.42	22 22 7.6	1.0	8.5	0.65
21	14 19.1	18 16 59.36	−22 22 14.5	1.0	8.5	0.65
22	14 14.9	18 16 45.00	22 22 21.5	1.0	8.5	0.65
23	14 10.8	18 16 30.38	22 22 28.5	1.0	8.5	0.65
24	14 6.6	18 16 15.49	22 22 35.7	1.0	8.5	0.66
25	14 2.4	18 16 0.34	22 22 43.0	1.0	8.5	0.66
26	13 58.2	18 15 44.93	−22 22 50.5	1.0	8.5	0.66
27	13 54.0	18 15 29.27	22 22 58.0	1.0	8.5	0.66
28	13 49.8	18 15 13.38	22 23 5.6	1.0	8.5	0.66
29	13 45.6	18 14 57.24	22 23 13.3	1.0	8.5	0.66
30	13 41.4	18 14 40.89	22 23 21.2	1.0	8.6	0.66
31	13 37.2	18 14 24.32	−22 23 29.1	1.0	8.6	0.66
June 1	13 33.0	18 14 7.55	22 23 37.1	1.0	8.6	0.66
2	13 28.8	18 13 50.58	22 23 45.2	1.0	8.6	0.66
3	13 24.6	18 13 33.41	22 23 53.3	1.0	8.6	0.66
4	13 20.4	18 13 16.08	22 24 1.4	1.0	8.6	0.66
5	13 16.1	18 12 58.58	−22 24 9.6	1.0	8.6	0.66
6	13 11.9	18 12 40.91	22 24 17.8	1.0	8.6	0.66
7	13 7.7	18 12 23.09	22 24 26.1	1.0	8.6	0.66
8	13 3.4	18 12 5.13	22 24 34.4	1.0	8.6	0.66
9	12 59.2	18 11 47.03	22 24 42.7	1.0	8.6	0.66
10	12 55.0	18 11 28.80	−22 24 51.1	1.0	8.6	0.66
11	12 50.7	18 11 10.45	22 24 59.5	1.0	8.6	0.66
12	12 46.5	18 10 52.00	22 25 7.9	1.0	8.6	0.66
13	12 42.3	18 10 33.45	22 25 16.2	1.0	8.6	0.66
14	12 38.0	18 10 14.79	22 25 24.6	1.0	8.6	0.66
15	12 33.8	18 9 56.04	−22 25 33.0	1.0	8.6	0.67
16	12 29.5	18 9 37.23	22 25 41.4	1.0	8.6	0.67
17	12 25.3	18 9 18.36	22 25 49.8	1.0	8.6	0.67
18	12 21.0	18 8 59.44	22 25 58.2	1.0	8.6	0.67
19	12 16.8	18 8 40.46	22 26 6.6	1.0	8.6	0.67
20	12 12.6	18 8 21.45	−22 26 15.0	1.0	8.6	0.67
21	12 8.3	18 8 2.41	−22 26 23.4	1.0	8.6	0.67

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
June 21	12 8.3	18 8 2.41	−22 26 23.4	1.0	8.6	0.67	Aug. 6	8 55.0	17 55 37.17	−22 32 20.2	0.9	8.4	0.65
22	12 4.1	18 7 43.35	22 26 31.7	1.0	8.6	0.67	7	8 50.9	17 55 26.84	22 32 28.0	0.9	8.4	0.65
23	11 59.8	18 7 24.28	22 26 40.0	1.0	8.6	0.67	8	8 46.8	17 55 16.87	22 32 35.8	0.9	8.4	0.65
24	11 55.6	18 7 5.22	22 26 48.3	1.0	8.6	0.67	9	8 42.7	17 55 7.26	22 32 43.7	0.9	8.4	0.65
25	11 51.3	18 6 46.18	22 26 56.6	1.0	8.6	0.67	10	8 38.7	17 54 58.00	22 32 51.7	0.9	8.4	0.65
26	11 47.1	18 6 27.15	−22 27 4.9	1.0	8.6	0.67	11	8 34.6	17 54 49.11	−22 32 59.7	0.9	8.3	0.64
27	11 42.8	18 6 8.15	22 27 13.1	1.0	8.6	0.67	12	8 30.5	17 54 40.59	22 33 7.7	0.9	8.3	0.64
28	11 38.5	18 5 49.20	22 27 21.2	1.0	8.6	0.67	13	8 26.4	17 54 32.44	22 33 15.8	0.9	8.3	0.64
29	11 34.3	18 5 30.30	22 27 29.3	1.0	8.6	0.67	14	8 22.4	17 54 24.67	22 33 23.9	0.9	8.3	0.64
30	11 30.0	18 5 11.46	22 27 37.4	1.0	8.6	0.67	15	8 18.3	17 54 17.28	22 33 32.1	0.9	8.3	0.64
July 1	11 25.8	18 4 52.69	−22 27 45.4	1.0	8.6	0.67	16	8 14.3	17 54 10.27	−22 33 40.4	0.9	8.3	0.64
2	11 21.5	18 4 34.01	22 27 53.4	1.0	8.6	0.67	17	8 10.2	17 54 3.64	22 33 48.7	0.9	8.3	0.64
3	11 17.3	18 4 15.42	22 28 1.4	1.0	8.6	0.67	18	8 6.2	17 53 57.41	22 33 57.1	0.9	8.3	0.64
4	11 13.1	18 3 56.92	22 28 9.4	1.0	8.6	0.67	19	8 2.2	17 53 51.58	22 34 5.7	0.9	8.2	0.63
5	11 8.8	18 3 38.53	22 28 17.3	1.0	8.6	0.67	20	7 58.2	17 53 46.14	22 34 14.3	0.9	8.2	0.63
6	11 4.6	18 3 20.27	−22 28 25.1	1.0	8.6	0.67	21	7 54.1	17 53 41.09	−22 34 23.0	0.9	8.2	0.63
7	11 0.4	18 3 2.14	22 28 32.9	1.0	8.6	0.67	22	7 50.1	17 53 36.46	22 34 31.7	0.9	8.2	0.63
8	10 56.1	18 2 44.13	22 28 40.6	1.0	8.6	0.67	23	7 46.1	17 53 32.23	22 34 40.5	0.9	8.2	0.63
9	10 51.9	18 2 26.28	22 28 48.3	1.0	8.6	0.66	24	7 42.1	17 53 28.41	22 34 49.3	0.9	8.2	0.63
10	10 47.7	18 2 8.58	22 28 56.0	1.0	8.6	0.66	25	7 38.2	17 53 25.00	22 34 58.2	0.9	8.2	0.63
11	10 43.5	18 1 51.04	−22 29 3.7	1.0	8.6	0.66	26	7 34.2	17 53 22.00	−22 35 7.2	0.9	8.2	0.63
12	10 39.2	18 1 33.66	22 29 11.3	1.0	8.6	0.66	27	7 30.2	17 53 19.42	22 35 16.3	0.9	8.1	0.63
13	10 35.0	18 1 16.46	22 29 18.9	1.0	8.6	0.66	28	7 26.2	17 53 17.27	22 35 25.4	0.9	8.1	0.63
14	10 30.8	18 0 59.46	22 29 26.5	1.0	8.6	0.66	29	7 22.3	17 53 15.53	22 35 34.5	0.9	8.1	0.63
15	10 26.6	18 0 42.65	22 29 34.1	1.0	8.6	0.66	30	7 18.3	17 53 14.20	22 35 43.8	0.9	8.1	0.63
16	10 22.4	18 0 26.03	−22 29 41.7	1.0	8.6	0.66	31	7 14.4	17 53 13.29	−22 35 53.1	0.9	8.1	0.63
17	10 18.2	18 0 9.62	22 29 49.3	1.0	8.5	0.66	Sept. 1	7 10.4	17 53 12.81	22 36 2.5	0.9	8.1	0.63
18	10 14.0	17 59 53.44	22 29 56.9	1.0	8.5	0.66	2	7 6.5	17 53 12.74	22 36 12.0	0.9	8.1	0.63
19	10 9.8	17 59 37.49	22 30 4.4	1.0	8.5	0.66	3	7 2.6	17 53 13.10	22 36 21.5	0.9	8.1	0.62
20	10 5.6	17 59 21.75	22 30 11.9	1.0	8.5	0.66	4	6 58.7	17 53 13.88	22 36 31.1	0.9	8.0	0.62
21	10 1.4	17 59 6.25	−22 30 19.4	1.0	8.5	0.66	5	6 54.8	17 53 15.08	−22 36 40.8	0.9	8.0	0.62
22	9 57.2	17 58 51.01	22 30 26.9	1.0	8.5	0.66	6	6 50.9	17 53 16.68	22 36 50.5	0.9	8.0	0.62
23	9 53.1	17 58 36.03	22 30 34.3	1.0	8.5	0.66	7	6 47.0	17 53 18.71	22 37 0.3	0.9	8.0	0.62
24	9 48.9	17 58 21.31	22 30 41.8	1.0	8.5	0.66	8	6 43.1	17 53 21.16	22 37 10.1	0.9	8.0	0.62
25	9 44.7	17 58 6.86	22 30 49.3	1.0	8.5	0.65	9	6 39.2	17 53 24.03	22 37 20.0	0.9	8.0	0.62
26	9 40.5	17 57 52.69	−22 30 56.8	1.0	8.5	0.65	10	6 35.3	17 53 27.33	−22 37 30.0	0.9	8.0	0.62
27	9 36.4	17 57 38.81	22 31 4.2	1.0	8.5	0.65	11	6 31.4	17 53 31.05	22 37 40.0	0.9	8.0	0.61
28	9 32.2	17 57 25.23	22 31 11.7	1.0	8.5	0.65	12	6 27.5	17 53 35.18	22 37 50.0	0.9	7.9	0.61
29	9 28.1	17 57 11.94	22 31 19.2	1.0	8.5	0.65	13	6 23.7	17 53 39.72	22 38 0.1	0.9	7.9	0.61
30	9 23.9	17 56 58.96	22 31 26.7	1.0	8.5	0.65	14	6 19.8	17 53 44.68	22 38 10.2	0.9	7.9	0.61
31	9 19.8	17 56 46.30	−22 31 34.3	1.0	8.5	0.65	15	6 16.0	17 53 50.06	−22 38 20.3	0.9	7.9	0.61
Aug. 1	9 15.6	17 56 33.94	22 31 41.9	1.0	8.5	0.65	16	6 12.2	17 53 55.85	22 38 30.5	0.9	7.9	0.61
2	9 11.5	17 56 21.91	22 31 49.5	0.9	8.5	0.65	17	6 8.3	17 54 2.06	22 38 40.7	0.9	7.9	0.61
3	9 7.4	17 56 10.22	22 31 57.1	0.9	8.4	0.65	18	6 4.5	17 54 8.68	22 38 50.9	0.9	7.9	0.61
4	9 3.3	17 55 58.87	22 32 4.8	0.9	8.4	0.65	19	6 0.7	17 54 15.72	22 39 1.1	0.9	7.8	0.60
5	8 59.1	17 55 47.85	−22 32 12.5	0.9	8.4	0.65	20	5 56.9	17 54 23.17	−22 39 11.3	0.9	7.8	0.60
6	8 55.0	17 55 37.17	−22 32 20.2	0.9	8.4	0.65	21	5 53.1	17 54 31.03	−22 39 21.6	0.9	7.8	0.60

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Mar. 1	18 4.5	16 43 38.08	−22 14 3.6	0.5	1.8	0.13	Apr. 16	15 2.4	16 42 24.18	−22 12 7.2	0.5	1.8	0.13
2	18 0.6	16 43 41.47	22 14 10.2	0.5	1.8	0.13	17	14 58.3	16 42 17.77	22 11 55.8	0.5	1.8	0.13
3	17 56.7	16 43 44.63	22 14 16.3	0.5	1.8	0.13	18	14 54.3	16 42 11.20	22 11 44.0	0.5	1.8	0.13
4	17 52.8	16 43 47.56	22 14 22.0	0.5	1.8	0.13	19	14 50.3	16 42 4.45	22 11 31.9	0.5	1.8	0.13
5	17 48.9	16 43 50.27	22 14 27.3	0.5	1.8	0.13	20	14 46.2	16 41 57.54	22 11 19.5	0.5	1.8	0.13
6	17 45.0	16 43 52.74	−22 14 32.3	0.5	1.8	0.13	21	14 42.2	16 41 50.47	−22 11 6.8	0.5	1.8	0.13
7	17 41.2	16 43 54.99	22 14 36.8	0.5	1.8	0.13	22	14 38.1	16 41 43.24	22 10 53.8	0.5	1.8	0.13
8	17 37.3	16 43 57.00	22 14 40.8	0.5	1.8	0.13	23	14 34.1	16 41 35.84	22 10 40.5	0.5	1.8	0.13
9	17 33.4	16 43 58.79	22 14 44.5	0.5	1.8	0.13	24	14 30.0	16 41 28.29	22 10 26.9	0.5	1.8	0.13
10	17 29.5	16 44 0.36	22 14 47.8	0.5	1.8	0.13	25	14 25.9	16 41 20.59	22 10 13.0	0.5	1.8	0.13
11	17 25.5	16 44 1.69	−22 14 50.6	0.5	1.8	0.13	26	14 21.9	16 41 12.74	−22 9 58.7	0.5	1.8	0.13
12	17 21.6	16 44 2.80	22 14 53.0	0.5	1.8	0.13	27	14 17.8	16 41 4.74	22 9 44.1	0.5	1.8	0.13
13	17 17.7	16 44 3.68	22 14 55.0	0.5	1.8	0.13	28	14 13.7	16 40 56.60	22 9 29.3	0.5	1.8	0.13
14	17 13.8	16 44 4.33	22 14 56.6	0.5	1.8	0.13	29	14 9.7	16 40 48.33	22 9 14.2	0.5	1.8	0.13
15	17 9.9	16 44 4.75	22 14 57.8	0.5	1.8	0.13	30	14 5.6	16 40 39.92	22 8 58.8	0.5	1.8	0.13
16	17 5.9	16 44 4.96	−22 14 58.6	0.5	1.8	0.13	May 1	14 1.5	16 40 31.39	−22 8 43.1	0.5	1.8	0.13
17	17 2.0	16 44 4.94	22 14 59.0	0.5	1.8	0.13	2	13 57.4	16 40 22.73	22 8 27.2	0.5	1.8	0.13
18	16 58.1	16 44 4.69	22 14 59.0	0.5	1.8	0.13	3	13 53.4	16 40 13.95	22 8 11.0	0.5	1.8	0.13
19	16 54.2	16 44 4.22	22 14 58.5	0.5	1.8	0.13	4	13 49.3	16 40 5.05	22 7 54.5	0.5	1.9	0.13
20	16 50.2	16 44 3.52	22 14 57.6	0.5	1.8	0.13	5	13 45.2	16 39 56.02	22 7 37.8	0.5	1.9	0.13
21	16 46.3	16 44 2.60	−22 14 56.4	0.5	1.8	0.13	6	13 41.1	16 39 46.89	−22 7 20.9	0.5	1.9	0.13
22	16 42.3	16 44 1.45	22 14 54.7	0.5	1.8	0.13	7	13 37.0	16 39 37.66	22 7 3.8	0.5	1.9	0.13
23	16 38.4	16 44 0.08	22 14 52.6	0.5	1.8	0.13	8	13 33.0	16 39 28.32	22 6 46.4	0.5	1.9	0.13
24	16 34.4	16 43 58.49	22 14 50.1	0.5	1.8	0.13	9	13 28.9	16 39 18.88	22 6 28.7	0.5	1.9	0.13
25	16 30.4	16 43 56.68	22 14 47.2	0.5	1.8	0.13	10	13 24.8	16 39 9.35	22 6 10.8	0.5	1.9	0.13
26	16 26.5	16 43 54.65	−22 14 43.9	0.5	1.8	0.13	11	13 20.7	16 38 59.74	−22 5 52.7	0.5	1.9	0.13
27	16 22.5	16 43 52.40	22 14 40.2	0.5	1.8	0.13	12	13 16.6	16 38 50.04	22 5 34.5	0.5	1.9	0.13
28	16 18.5	16 43 49.93	22 14 36.2	0.5	1.8	0.13	13	13 12.5	16 38 40.26	22 5 16.1	0.5	1.9	0.13
29	16 14.5	16 43 47.25	22 14 31.8	0.5	1.8	0.13	14	13 8.4	16 38 30.40	22 4 57.5	0.5	1.9	0.13
30	16 10.6	16 43 44.35	22 14 27.0	0.5	1.8	0.13	15	13 4.3	16 38 20.46	22 4 38.7	0.5	1.9	0.13
31	16 6.6	16 43 41.24	−22 14 21.7	0.5	1.8	0.13	16	13 0.2	16 38 10.45	−22 4 19.7	0.5	1.9	0.13
Apr. 1	16 2.6	16 43 37.92	22 14 16.0	0.5	1.8	0.13	17	12 56.1	16 38 0.37	22 4 0.6	0.5	1.9	0.13
2	15 58.6	16 43 34.39	22 14 9.9	0.5	1.8	0.13	18	12 52.0	16 37 50.24	22 3 41.3	0.5	1.9	0.13
3	15 54.6	16 43 30.65	22 14 3.6	0.5	1.8	0.13	19	12 47.9	16 37 40.05	22 3 21.9	0.5	1.9	0.13
4	15 50.6	16 43 26.71	22 13 56.9	0.5	1.8	0.13	20	12 43.8	16 37 29.81	22 3 2.3	0.5	1.9	0.13
5	15 46.6	16 43 22.57	−22 13 49.8	0.5	1.8	0.13	21	12 39.7	16 37 19.51	−22 2 42.5	0.5	1.9	0.13
6	15 42.6	16 43 18.22	22 13 42.3	0.5	1.8	0.13	22	12 35.6	16 37 9.16	22 2 22.7	0.5	1.9	0.13
7	15 38.6	16 43 13.67	22 13 34.4	0.5	1.8	0.13	23	12 31.5	16 36 58.77	22 2 2.8	0.5	1.9	0.13
8	15 34.6	16 43 8.93	22 13 26.2	0.5	1.8	0.13	24	12 27.4	16 36 48.35	22 1 42.7	0.5	1.9	0.13
9	15 30.6	16 43 3.99	22 13 17.6	0.5	1.8	0.13	25	12 23.3	16 36 37.89	22 1 22.4	0.5	1.9	0.13
10	15 26.5	16 42 58.86	−22 13 8.5	0.5	1.8	0.13	26	12 19.2	16 36 27.40	−22 1 2.1	0.5	1.9	0.13
11	15 22.5	16 42 53.54	22 12 59.1	0.5	1.8	0.13	27	12 15.1	16 36 16.90	22 0 41.7	0.5	1.9	0.13
12	15 18.5	16 42 48.03	22 12 49.4	0.5	1.8	0.13	28	12 11.0	16 36 6.37	22 0 21.2	0.5	1.9	0.13
13	15 14.5	16 42 42.34	22 12 39.4	0.5	1.8	0.13	29	12 6.9	16 35 55.83	22 0 0.7	0.5	1.9	0.13
14	15 10.4	16 42 36.47	22 12 29.0	0.5	1.8	0.13	30	12 2.7	16 35 45.28	21 59 40.1	0.5	1.9	0.13
15	15 6.4	16 42 30.42	−22 12 18.3	0.5	1.8	0.13	31	11 58.6	16 35 34.73	−21 59 19.5	0.5	1.9	0.13
16	15 2.4	16 42 24.18	−22 12 7.2	0.5	1.8	0.13	June 1	11 54.5	16 35 24.18	−21 58 58.8	0.5	1.9	0.13

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
June 1	11 54.5	16 35 24.18	−21 58 58.8	0.5	1.9	0.13	July 16	8 50.8	16 28 36.26	−21 45 12.2	0.5	1.8	0.13
2	11 50.4	16 35 13.63	21 58 38.1	0.5	1.9	0.13	17	8 46.8	16 28 30.02	21 44 59.3	0.5	1.8	0.13
3	11 46.3	16 35 3.08	21 58 17.4	0.5	1.9	0.13	18	8 42.8	16 28 23.95	21 44 46.8	0.5	1.8	0.13
4	11 42.2	16 34 52.55	21 57 56.6	0.5	1.9	0.13	19	8 38.7	16 28 18.05	21 44 34.7	0.5	1.8	0.13
5	11 38.1	16 34 42.04	21 57 35.8	0.5	1.9	0.13	20	8 34.7	16 28 12.33	21 44 22.9	0.5	1.8	0.13
6	11 34.0	16 34 31.55	−21 57 15.1	0.5	1.9	0.13	21	8 30.7	16 28 6.79	−21 44 11.5	0.5	1.8	0.13
7	11 29.9	16 34 21.09	21 56 54.4	0.5	1.9	0.13	22	8 26.7	16 28 1.43	21 44 0.5	0.5	1.8	0.13
8	11 25.8	16 34 10.67	21 56 33.7	0.5	1.9	0.13	23	8 22.6	16 27 56.25	21 43 49.9	0.5	1.8	0.13
9	11 21.7	16 34 0.28	21 56 13.0	0.5	1.9	0.13	24	8 18.6	16 27 51.26	21 43 39.7	0.5	1.8	0.13
10	11 17.6	16 33 49.92	21 55 52.3	0.5	1.9	0.13	25	8 14.6	16 27 46.46	21 43 29.8	0.5	1.8	0.13
11	11 13.5	16 33 39.61	−21 55 31.8	0.5	1.9	0.13	26	8 10.6	16 27 41.86	−21 43 20.3	0.5	1.8	0.13
12	11 9.4	16 33 29.35	21 55 11.3	0.5	1.9	0.13	27	8 6.6	16 27 37.45	21 43 11.3	0.5	1.8	0.13
13	11 5.3	16 33 19.14	21 54 50.8	0.5	1.9	0.13	28	8 2.6	16 27 33.23	21 43 2.7	0.5	1.8	0.13
14	11 1.2	16 33 8.98	21 54 30.4	0.5	1.9	0.13	29	7 58.6	16 27 29.20	21 42 54.5	0.5	1.8	0.13
15	10 57.1	16 32 58.88	21 54 10.1	0.5	1.9	0.13	30	7 54.6	16 27 25.37	21 42 46.8	0.5	1.8	0.13
16	10 53.0	16 32 48.85	−21 53 49.9	0.5	1.9	0.13	31	7 50.6	16 27 21.75	−21 42 39.5	0.5	1.8	0.13
17	10 48.9	16 32 38.89	21 53 29.8	0.5	1.9	0.13	Aug. 1	7 46.6	16 27 18.33	21 42 32.6	0.5	1.8	0.13
18	10 44.8	16 32 28.99	21 53 9.8	0.5	1.9	0.13	2	7 42.6	16 27 15.10	21 42 26.1	0.5	1.8	0.13
19	10 40.7	16 32 19.17	21 52 49.9	0.5	1.9	0.13	3	7 38.7	16 27 12.08	21 42 20.1	0.5	1.8	0.13
20	10 36.6	16 32 9.43	21 52 30.2	0.5	1.9	0.13	4	7 34.7	16 27 9.27	21 42 14.6	0.5	1.8	0.13
21	10 32.5	16 31 59.76	−21 52 10.6	0.5	1.9	0.13	5	7 30.7	16 27 6.66	−21 42 9.5	0.5	1.8	0.13
22	10 28.4	16 31 50.18	21 51 51.1	0.5	1.9	0.13	6	7 26.7	16 27 4.26	21 42 4.9	0.5	1.8	0.13
23	10 24.3	16 31 40.70	21 51 31.7	0.5	1.9	0.13	7	7 22.8	16 27 2.07	21 42 0.7	0.5	1.8	0.13
24	10 20.2	16 31 31.31	21 51 12.5	0.5	1.9	0.13	8	7 18.8	16 27 0.09	21 41 57.0	0.5	1.8	0.13
25	10 16.2	16 31 22.02	21 50 53.6	0.5	1.9	0.13	9	7 14.8	16 26 58.32	21 41 53.8	0.5	1.8	0.13
26	10 12.1	16 31 12.84	−21 50 34.9	0.5	1.9	0.13	10	7 10.9	16 26 56.75	−21 41 51.1	0.5	1.8	0.13
27	10 8.0	16 31 3.75	21 50 16.4	0.5	1.9	0.13	11	7 6.9	16 26 55.39	21 41 48.8	0.5	1.8	0.13
28	10 3.9	16 30 54.78	21 49 58.1	0.5	1.9	0.13	12	7 3.0	16 26 54.25	21 41 47.0	0.5	1.8	0.13
29	9 59.8	16 30 45.93	21 49 39.9	0.5	1.9	0.13	13	6 59.0	16 26 53.32	21 41 45.6	0.5	1.8	0.13
30	9 55.7	16 30 37.20	21 49 22.0	0.5	1.8	0.13	14	6 55.1	16 26 52.60	21 41 44.8	0.5	1.8	0.13
July 1	9 51.7	16 30 28.59	−21 49 4.3	0.5	1.8	0.13	15	6 51.1	16 26 52.10	−21 41 44.4	0.5	1.8	0.13
2	9 47.6	16 30 20.11	21 48 46.9	0.5	1.8	0.13	16	6 47.2	16 26 51.81	21 41 44.5	0.5	1.8	0.13
3	9 43.5	16 30 11.75	21 48 29.7	0.5	1.8	0.13	17	6 43.3	16 26 51.74	21 41 45.1	0.5	1.8	0.13
4	9 39.5	16 30 3.53	21 48 12.7	0.5	1.8	0.13	18	6 39.3	16 26 51.89	21 41 46.1	0.5	1.8	0.13
5	9 35.4	16 29 55.45	21 47 56.1	0.5	1.8	0.13	19	6 35.4	16 26 52.26	21 41 47.6	0.5	1.8	0.13
6	9 31.3	16 29 47.51	−21 47 39.7	0.5	1.8	0.13	20	6 31.5	16 26 52.84	−21 41 49.5	0.5	1.8	0.13
7	9 27.3	16 29 39.70	21 47 23.6	0.5	1.8	0.13	21	6 27.6	16 26 53.63	21 41 51.9	0.5	1.8	0.13
8	9 23.2	16 29 32.03	21 47 7.7	0.5	1.8	0.13	22	6 23.6	16 26 54.65	21 41 54.9	0.5	1.8	0.13
9	9 19.2	16 29 24.51	21 46 52.1	0.5	1.8	0.13	23	6 19.7	16 26 55.89	21 41 58.4	0.5	1.8	0.13
10	9 15.1	16 29 17.15	21 46 36.8	0.5	1.8	0.13	24	6 15.8	16 26 57.35	21 42 2.4	0.5	1.8	0.13
11	9 11.1	16 29 9.94	−21 46 21.9	0.5	1.8	0.13	25	6 11.9	16 26 59.03	−21 42 6.8	0.5	1.8	0.13
12	9 7.0	16 29 2.88	21 46 7.3	0.5	1.8	0.13	26	6 8.0	16 27 0.92	21 42 11.7	0.5	1.8	0.13
13	9 3.0	16 28 55.98	21 45 53.0	0.5	1.8	0.13	27	6 4.1	16 27 3.04	21 42 17.0	0.5	1.8	0.13
14	8 58.9	16 28 49.24	21 45 39.1	0.5	1.8	0.13	28	6 0.2	16 27 5.38	21 42 22.8	0.5	1.8	0.13
15	8 54.9	16 28 42.67	21 45 25.5	0.5	1.8	0.13	29	5 56.4	16 27 7.93	21 42 29.1	0.5	1.8	0.13
16	8 50.8	16 28 36.26	−21 45 12.2	0.5	1.8	0.13	30	5 52.5	16 27 10.71	−21 42 36.0	0.5	1.8	0.13
17	8 46.8	16 28 30.02	−21 44 59.3	0.5	1.8	0.13	31	5 48.6	16 27 13.71	−21 42 43.3	0.5	1.8	0.13

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	10 57.9	5 39 20.20	+22 3 58.7	0.3	1.3	0.10	Feb. 14	7 57.1	5 35 25.72	+22 3 27.3	0.3	1.3	0.09
1	10 53.8	5 39 13.19	22 3 56.4	0.3	1.3	0.10	15	7 53.1	5 35 23.10	22 3 28.6	0.3	1.3	0.09
2	10 49.8	5 39 6.23	22 3 54.2	0.3	1.3	0.10	16	7 49.1	5 35 20.62	22 3 30.0	0.3	1.3	0.09
3	10 45.8	5 38 59.32	22 3 52.1	0.3	1.3	0.10	17	7 45.2	5 35 18.27	22 3 31.5	0.3	1.3	0.09
4	10 41.7	5 38 52.47	22 3 50.0	0.3	1.3	0.10	18	7 41.2	5 35 16.06	22 3 33.1	0.3	1.3	0.09
5	10 37.7	5 38 45.66	+22 3 47.9	0.3	1.3	0.10	19	7 37.2	5 35 13.99	+22 3 34.8	0.3	1.3	0.09
6	10 33.6	5 38 38.92	22 3 45.9	0.3	1.3	0.10	20	7 33.3	5 35 12.06	22 3 36.6	0.3	1.3	0.09
7	10 29.6	5 38 32.24	22 3 44.0	0.3	1.3	0.10	21	7 29.3	5 35 10.28	22 3 38.5	0.3	1.3	0.09
8	10 25.6	5 38 25.62	22 3 42.2	0.3	1.3	0.10	22	7 25.3	5 35 8.64	22 3 40.5	0.3	1.3	0.09
9	10 21.5	5 38 19.06	22 3 40.4	0.3	1.3	0.10	23	7 21.4	5 35 7.15	22 3 42.6	0.3	1.3	0.09
10	10 17.5	5 38 12.57	+22 3 38.7	0.3	1.3	0.10	24	7 17.4	5 35 5.79	+22 3 44.8	0.3	1.3	0.09
11	10 13.4	5 38 6.15	22 3 37.0	0.3	1.3	0.10	25	7 13.5	5 35 4.57	22 3 47.0	0.3	1.3	0.09
12	10 9.4	5 37 59.81	22 3 35.4	0.3	1.3	0.10	26	7 9.5	5 35 3.48	22 3 49.3	0.3	1.3	0.09
13	10 5.4	5 37 53.54	22 3 33.8	0.3	1.3	0.10	27	7 5.6	5 35 2.55	22 3 51.8	0.3	1.3	0.09
14	10 1.3	5 37 47.35	22 3 32.3	0.3	1.3	0.10	28	7 1.6	5 35 1.77	22 3 54.3	0.3	1.3	0.09
15	9 57.3	5 37 41.24	+22 3 30.9	0.3	1.3	0.10	Mar. 1	6 57.7	5 35 1.14	+22 3 56.9	0.3	1.3	0.09
16	9 53.3	5 37 35.21	22 3 29.6	0.3	1.3	0.10	2	6 53.8	5 35 0.67	22 3 59.7	0.3	1.3	0.09
17	9 49.2	5 37 29.26	22 3 28.4	0.3	1.3	0.10	3	6 49.8	5 35 0.34	22 4 2.6	0.3	1.3	0.09
18	9 45.2	5 37 23.40	22 3 27.2	0.3	1.3	0.10	4	6 45.9	5 35 0.15	22 4 5.6	0.3	1.3	0.09
19	9 41.2	5 37 17.63	22 3 26.1	0.3	1.3	0.10	5	6 41.9	5 35 0.10	22 4 8.6	0.3	1.3	0.09
20	9 37.2	5 37 11.95	+22 3 25.0	0.3	1.3	0.10	6	6 38.0	5 35 0.20	+22 4 11.7	0.3	1.3	0.09
21	9 33.1	5 37 6.37	22 3 24.0	0.3	1.3	0.10	7	6 34.1	5 35 0.46	22 4 14.9	0.3	1.3	0.09
22	9 29.1	5 37 0.89	22 3 23.1	0.3	1.3	0.10	8	6 30.2	5 35 0.86	22 4 18.2	0.3	1.3	0.09
23	9 25.1	5 36 55.50	22 3 22.3	0.3	1.3	0.10	9	6 26.2	5 35 1.41	22 4 21.6	0.3	1.3	0.09
24	9 21.1	5 36 50.20	22 3 21.6	0.3	1.3	0.10	10	6 22.3	5 35 2.10	22 4 25.1	0.3	1.3	0.09
25	9 17.0	5 36 45.00	+22 3 21.0	0.3	1.3	0.10	11	6 18.4	5 35 2.94	+22 4 28.7	0.3	1.3	0.09
26	9 13.0	5 36 39.91	22 3 20.5	0.3	1.3	0.10	12	6 14.5	5 35 3.93	22 4 32.3	0.3	1.3	0.09
27	9 9.0	5 36 34.93	22 3 20.0	0.3	1.3	0.09	13	6 10.6	5 35 5.06	22 4 36.0	0.3	1.3	0.09
28	9 5.0	5 36 30.07	22 3 19.6	0.3	1.3	0.09	14	6 6.7	5 35 6.34	22 4 39.9	0.3	1.3	0.09
29	9 1.0	5 36 25.32	22 3 19.3	0.3	1.3	0.09	15	6 2.7	5 35 7.77	+22 4 43.9	0.3	1.3	0.09
30	8 57.0	5 36 20.68	+22 3 19.1	0.3	1.3	0.09	Sept. 15	18 16.7	5 56 28.98	+22 13 45.3	0.3	1.3	0.09
31	8 53.0	5 36 16.15	22 3 19.0	0.3	1.3	0.09	16	18 12.7	5 56 31.26	22 13 43.5	0.3	1.3	0.09
Feb. 1	8 49.0	5 36 11.73	22 3 19.1	0.3	1.3	0.09	17	18 8.8	5 56 33.40	22 13 41.7	0.3	1.3	0.09
2	8 45.0	5 36 7.43	22 3 19.2	0.3	1.3	0.09	18	18 4.9	5 56 35.40	22 13 39.9	0.3	1.3	0.09
3	8 41.0	5 36 3.26	22 3 19.4	0.3	1.3	0.09	19	18 1.0	5 56 37.25	22 13 38.0	0.3	1.3	0.09
4	8 37.0	5 35 59.21	+22 3 19.7	0.3	1.3	0.09	20	17 57.1	5 56 38.96	+22 13 36.1	0.3	1.3	0.09
5	8 33.0	5 35 55.28	22 3 20.1	0.3	1.3	0.09	21	17 53.2	5 56 40.53	22 13 34.2	0.3	1.3	0.09
6	8 29.0	5 35 51.47	22 3 20.5	0.3	1.3	0.09	22	17 49.3	5 56 41.95	22 13 32.3	0.3	1.3	0.09
7	8 25.0	5 35 47.79	22 3 21.0	0.3	1.3	0.09	23	17 45.4	5 56 43.22	22 13 30.4	0.3	1.3	0.09
8	8 21.0	5 35 44.24	22 3 21.6	0.3	1.3	0.09	24	17 41.5	5 56 44.35	22 13 28.5	0.3	1.3	0.09
9	8 17.0	5 35 40.82	+22 3 22.3	0.3	1.3	0.09	25	17 37.6	5 56 45.34	+22 13 26.5	0.3	1.3	0.09
10	8 13.0	5 35 37.52	22 3 23.1	0.3	1.3	0.09	26	17 33.7	5 56 46.18	22 13 24.5	0.3	1.3	0.09
11	8 9.0	5 35 34.36	22 3 24.0	0.3	1.3	0.09	27	17 29.7	5 56 46.87	22 13 22.5	0.3	1.3	0.09
12	8 5.0	5 35 31.34	22 3 25.0	0.3	1.3	0.09	28	17 25.8	5 56 47.42	22 13 20.5	0.3	1.3	0.09
13	8 1.1	5 35 28.46	22 3 26.1	0.3	1.3	0.09	29	17 21.9	5 56 47.82	22 13 18.5	0.3	1.3	0.09
14	7 57.1	5 35 25.72	+22 3 27.3	0.3	1.3	0.09	30	17 18.0	5 56 48.08	+22 13 16.5	0.3	1.3	0.09
15	7 53.1	5 35 23.10	+22 3 28.6	0.3	1.3	0.09	Oct. 1	17 14.1	5 56 48.19	+22 13 14.5	0.3	1.3	0.09

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent R. Ascension at Transit.	Apparent Declination at Transit.	Hor. Par.	Semi-diam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	17 14.1	5 56 48.19	+22 13 14.5	0.3	1.3	0.09	Nov. 16	14 10.9	5 54 26.96	+22 11 43.9	0.3	1.3	0.10
2	17 10.1	5 56 48.16	22 13 12.5	0.3	1.3	0.09	17	14 6.8	5 54 21.15	22 11 42.2	0.3	1.3	0.10
3	17 6.2	5 56 47.98	22 13 10.5	0.3	1.3	0.09	18	14 2.8	5 54 15.25	22 11 40.4	0.3	1.3	0.10
4	17 2.3	5 56 47.66	22 13 8.5	0.3	1.3	0.09	19	13 58.8	5 54 9.27	22 11 38.7	0.3	1.3	0.10
5	16 58.3	5 56 47.19	22 13 6.5	0.3	1.3	0.09	20	13 54.8	5 54 3.20	22 11 37.0	0.3	1.3	0.10
6	16 54.4	5 56 46.58	+22 13 4.5	0.3	1.3	0.09	21	13 50.7	5 53 57.04	+22 11 35.3	0.3	1.3	0.10
7	16 50.4	5 56 45.84	22 13 2.5	0.3	1.3	0.09	22	13 46.7	5 53 50.80	22 11 33.6	0.3	1.3	0.10
8	16 46.5	5 56 44.95	22 13 0.4	0.3	1.3	0.09	23	13 42.6	5 53 44.49	22 11 31.9	0.3	1.3	0.10
9	16 42.6	5 56 43.91	22 12 58.4	0.3	1.3	0.09	24	13 38.6	5 53 38.11	22 11 30.2	0.3	1.3	0.10
10	16 38.6	5 56 42.73	22 12 56.3	0.3	1.3	0.09	25	13 34.6	5 53 31.65	22 11 28.6	0.3	1.3	0.10
11	16 34.7	5 56 41.41	+22 12 54.3	0.3	1.3	0.09	26	13 30.5	5 53 25.12	+22 11 27.0	0.3	1.3	0.10
12	16 30.7	5 56 39.95	22 12 52.2	0.3	1.3	0.09	27	13 26.5	5 53 18.54	22 11 25.4	0.3	1.3	0.10
13	16 26.7	5 56 38.35	22 12 50.2	0.3	1.3	0.09	28	13 22.4	5 53 11.89	22 11 23.8	0.3	1.3	0.10
14	16 22.8	5 56 36.61	22 12 48.1	0.3	1.3	0.09	29	13 18.4	5 53 5.19	22 11 22.2	0.3	1.3	0.10
15	16 18.8	5 56 34.73	22 12 46.1	0.3	1.3	0.09	30	13 14.4	5 52 58.41	22 11 20.7	0.3	1.3	0.10
16	16 14.9	5 56 32.70	+22 12 44.0	0.3	1.3	0.09	Dec. 1	13 10.3	5 52 51.59	+22 11 19.2	0.3	1.3	0.10
17	16 10.9	5 56 30.54	22 12 42.0	0.3	1.3	0.09	2	13 6.3	5 52 44.72	22 11 17.7	0.3	1.3	0.10
18	16 6.9	5 56 28.24	22 12 39.9	0.3	1.3	0.09	3	13 2.2	5 52 37.80	22 11 16.2	0.3	1.3	0.10
19	16 2.9	5 56 25.79	22 12 37.9	0.3	1.3	0.09	4	12 58.2	5 52 30.83	22 11 14.7	0.3	1.3	0.10
20	15 59.0	5 56 23.20	22 12 35.9	0.3	1.3	0.09	5	12 54.1	5 52 23.82	22 11 13.2	0.3	1.3	0.10
21	15 55.0	5 56 20.49	+22 12 33.9	0.3	1.3	0.09	6	12 50.1	5 52 16.76	+22 11 11.7	0.3	1.3	0.10
22	15 51.0	5 56 17.65	22 12 31.8	0.3	1.3	0.09	7	12 46.0	5 52 9.66	22 11 10.3	0.3	1.3	0.10
23	15 47.0	5 56 14.68	22 12 29.8	0.3	1.3	0.09	8	12 42.0	5 52 2.53	22 11 8.9	0.3	1.3	0.10
24	15 43.0	5 56 11.57	22 12 27.8	0.3	1.3	0.09	9	12 37.9	5 51 55.37	22 11 7.5	0.3	1.3	0.10
25	15 39.1	5 56 8.33	22 12 25.8	0.3	1.3	0.09	10	12 33.9	5 51 48.18	22 11 6.1	0.3	1.3	0.10
26	15 35.1	5 56 4.96	+22 12 23.8	0.3	1.3	0.09	11	12 29.8	5 51 40.95	+22 11 4.8	0.3	1.3	0.10
27	15 31.1	5 56 1.46	22 12 21.8	0.3	1.3	0.09	12	12 25.8	5 51 33.70	22 11 3.5	0.3	1.3	0.10
28	15 27.1	5 55 57.83	22 12 19.8	0.3	1.3	0.09	13	12 21.7	5 51 26.43	22 11 2.2	0.3	1.3	0.10
29	15 23.1	5 55 54.07	22 12 17.8	0.3	1.3	0.09	14	12 17.7	5 51 19.14	22 11 0.9	0.3	1.3	0.10
30	15 19.1	5 55 50.19	22 12 15.8	0.3	1.3	0.09	15	12 13.6	5 51 11.83	22 10 59.6	0.3	1.3	0.10
31	15 15.1	5 55 46.19	+22 12 13.9	0.3	1.3	0.09	16	12 9.6	5 51 4.51	+22 10 58.3	0.3	1.3	0.10
Nov. 1	15 11.1	5 55 42.07	22 12 12.0	0.3	1.3	0.09	17	12 5.5	5 50 57.19	22 10 57.1	0.3	1.3	0.10
2	15 7.1	5 55 37.83	22 12 10.0	0.3	1.3	0.09	18	12 1.4	5 50 49.87	22 10 55.9	0.3	1.3	0.10
3	15 3.1	5 55 33.47	22 12 8.1	0.3	1.3	0.09	19	11 57.4	5 50 42.54	22 10 54.8	0.3	1.3	0.10
4	14 59.1	5 55 29.00	22 12 6.2	0.3	1.3	0.09	20	11 53.3	5 50 35.21	22 10 53.7	0.3	1.3	0.10
5	14 55.1	5 55 24.42	+22 12 4.3	0.3	1.3	0.09	21	11 49.3	5 50 27.88	+22 10 52.6	0.3	1.3	0.10
6	14 51.1	5 55 19.73	22 12 2.4	0.3	1.3	0.09	22	11 45.2	5 50 20.55	22 10 51.5	0.3	1.3	0.10
7	14 47.0	5 55 14.92	22 12 0.5	0.3	1.3	0.09	23	11 41.2	5 50 13.23	22 10 50.5	0.3	1.3	0.10
8	14 43.0	5 55 10.00	22 11 58.6	0.3	1.3	0.10	24	11 37.1	5 50 5.92	22 10 49.5	0.3	1.3	0.10
9	14 39.0	5 55 4.97	22 11 56.7	0.3	1.3	0.10	25	11 33.1	5 49 58.62	22 10 48.5	0.3	1.3	0.10
10	14 35.0	5 54 59.83	+22 11 54.8	0.3	1.3	0.10	26	11 29.0	5 49 51.34	+22 10 47.6	0.3	1.3	0.10
11	14 31.0	5 54 54.59	22 11 52.9	0.3	1.3	0.10	27	11 25.0	5 49 44.08	22 10 46.7	0.3	1.3	0.10
12	14 27.0	5 54 49.26	22 11 51.1	0.3	1.3	0.10	28	11 20.9	5 49 36.86	22 10 45.8	0.3	1.3	0.10
13	14 22.9	5 54 43.83	22 11 49.3	0.3	1.3	0.10	29	11 16.9	5 49 29.66	22 10 45.0	0.3	1.3	0.10
14	14 18.9	5 54 38.30	22 11 47.5	0.3	1.3	0.10	30	11 12.8	5 49 22.49	22 10 44.2	0.3	1.3	0.10
15	14 14.9	5 54 32.68	+22 11 45.7	0.3	1.3	0.10	31	11 8.8	5 49 15.35	+22 10 43.4	0.3	1.3	0.10
16	14 10.9	5 54 26.96	+22 11 43.9	0.3	1.3	0.10	32	11 4.7	5 49 8.24	+22 10 42.7	0.3	1.3	0.10

PART III

PHENOMENA

ECLIPSES IN 1900.

In the year 1900 there will be three eclipses, two of the sun and one of the moon.

I.—*A Total Eclipse of the Sun*, 1900, May 28, visible at Washington as a partial eclipse.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, May 28ᵈ 2ʰ 57ᵐ 2ˢ.7

Sun and moon's R. A.	4ʰ 19ᵐ 47ˢ.38	Hourly motions	10ˢ.16 and 149ˢ.08
Sun's declination	21° 27′ 16″.0 N.	Hourly motion	0′ 24″.2 N.
Moon's declination	21 50 17.4 N.	Hourly motion	2 41.0 N.
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 46.6
Moon's equa. hor. parallax	58 27.4	Moon's true semidiameter	15 55.0

CIRCUMSTANCES OF THE ECLIPSE.

		d h m	Longitude from Greenwich. ° ′	Latitude. ° ′
Eclipse begins	May	28 0 12.5	97 49.5 W.	9 59.2 N.
Central eclipse begins		28 1 14.5	116 38.4 W.	17 50.3 N.
Central eclipse at noon		28 2 57.0	45 0.4 W.	44 56.8 N.
Central eclipse ends		28 4 33.5	31 37.1 E.	25 20.6 N.
Eclipse ends		28 5 35.6	12 29.4 E.	17 32.8 N.

II.—*A Partial Eclipse of the Moon*, 1900, June 12, visible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, June 12ᵈ 15ʰ 31ᵐ 30ˢ.0

Sun's right ascension	5ʰ 23ᵐ 37ˢ.06	Hourly motion	10ˢ.36
Moon's right ascension	17 23 37.06	Hourly motion	145.04
Sun's declination	23° 11′ 16″.1 N.	Hourly motion	0′ 9″.0 N.
Moon's declination	22 12 57.2 S.	Hourly motion	0 55.3 N
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 44.8
Moon's equa. hor. parallax	57 29.7	Moon's true semidiameter	15 39.2

CIRCUMSTANCES OF THE ECLIPSE.

		d h m	
Moon enters penumbra	June	12 13 15.0	Greenwich Mean Time.
Moon enters shadow		12 15 24.4	
Middle of the eclipse		12 15 28.1	
Moon leaves shadow		12 15 31.7	
Moon leaves penumbra		12 17 41.2	

Contacts of Shadow with moon's limb.	Angles of position from north point. °	The moon being in the zenith in longitude from Greenwich ° ′	and in latitude. ° ′
First	176 E.	51 16.2 W.	22 13.1 S.
Last	180 E.	52 3.3 W.	22 13.0 S.

Magnitude of the eclipse 0.001 (moon's diameter = 1.0).

III.—***An Annular Eclipse of the Sun,*** 1900, November 21, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, November $21^d\ 19^h\ 22^m\ 49^s.0$

Sun and moon's R. A.	$15^h\ 49^m\ 26^s.34$	Hourly motions	$10^s.52$ and $130^s.97$
Sun's declination	20° 3′ 59″.8 S.	Hourly motion	0′ 32″.5 S.
Moon's declination	20 16 25.8 S.	Hourly motion	3 49.8 S.
Sun's equa. hor. parallax	8.9	Sun's true semidiameter	16 11.9
Moon's equa. hor. parallax	55 10.1	Moon's true semidiameter	15 1.2

CIRCUMSTANCES OF THE ECLIPSE.

		d	h	m	Longitude from Greenwich. ° ′		Latitude. ° ′	
Eclipse begins	November	21	16	9.6	21 4.9	E.	1 28.2	S.
Central eclipse begins		21	17	26.6	2 41.1	E.	5 59.7	S.
Central eclipse at noon		21	19	22.8	65 49.9	E.	33 19.1	S.
Central eclipse ends		21	21	12.9	135 19.4	E.	18 26.8	S.
Eclipse ends		21	22	19.8	116 48.0	E.	13 58.8	S.

The regions within which the eclipses of the sun are visible are laid down on the accompanying charts; from which, by means of the dotted lines, the Greenwich times of beginning and ending may be found within a few minutes.

BESSELIAN ELEMENTS OF THE TOTAL ECLIPSE OF THE SUN, 1900, MAY 28.

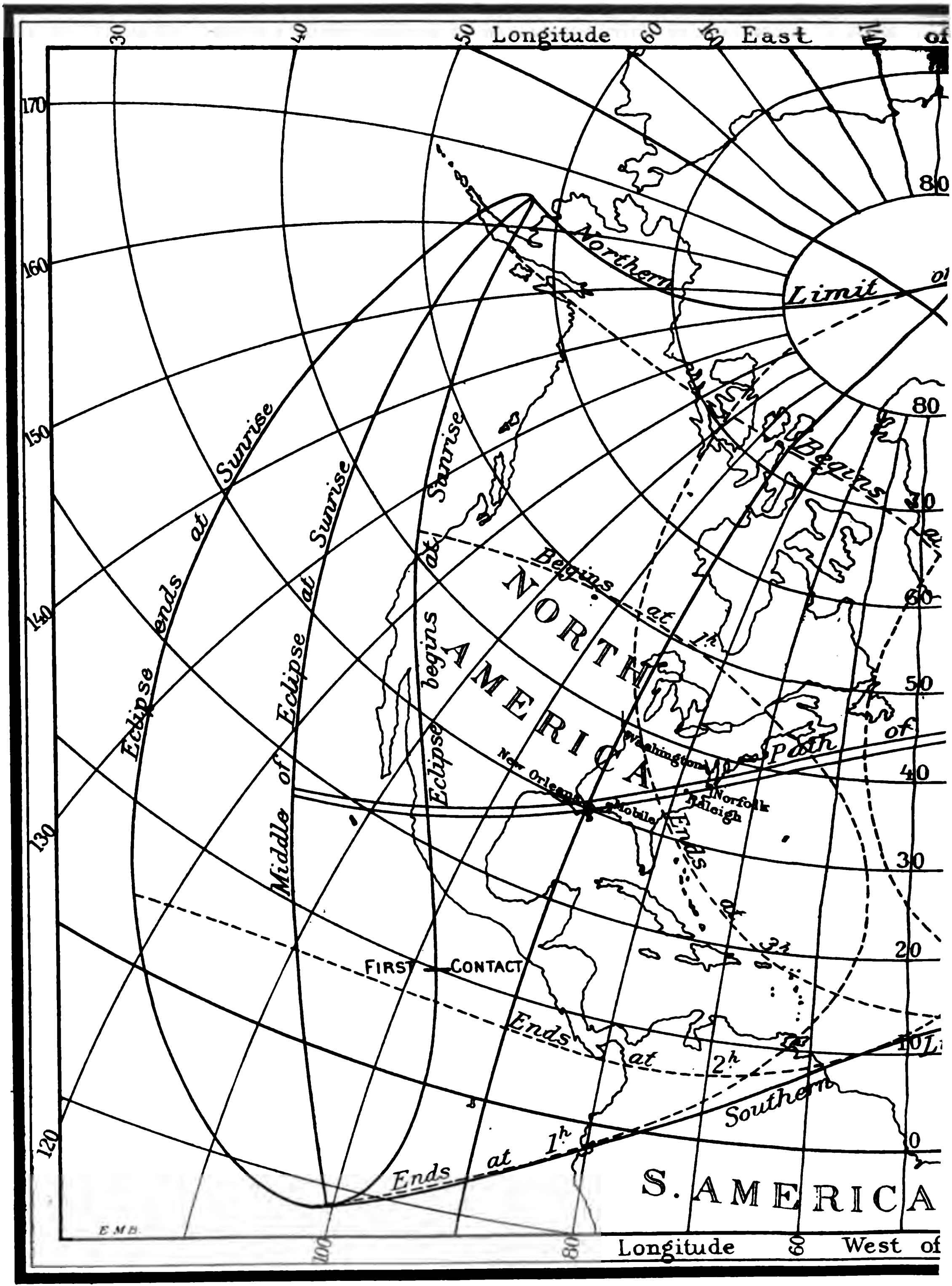
Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	*y*	Log sin *d*	Log cos *d*	*μ*	*l*	*l′*
h m					° ′		
0 0	−1.63125	+0.27752	+9.56280	+9.96888	0 44.6	+0.54308	−0.00282
10	1.53913	0.28423	9.56282	9.96887	3 14.6	0.54311	0.00279
20	1.44701	0.29092	9.56284	9.96887	5 44.6	0.54314	0.00276
30	1.35489	0.29761	9.56287	9.96887	8 14.6	0.54316	0.00273
40	1.26276	0.30429	9.56289	9.96886	10 44.6	0.54319	0.00270
50	1.17063	0.31095	9.56291	9.96886	13 14.7	0.54322	0.00268
1 0	−1.07849	+0.31761	+9.56293	+9.96886	15 44.7	+0.54325	−0.00265
10	0.98636	0.32426	9.56295	9.96885	18 14.7	0.54328	0.00263
20	0.89422	0.33090	9.56297	9.96885	20 44.7	0.54330	0.00260
30	0.80208	0.33753	9.56299	9.96885	23 14.7	0.54332	0.00258
40	0.70994	0.34415	9.56302	9.96884	25 44.7	0.54334	0.00255
50	0.61780	0.35076	9.56304	9.96884	28 14.7	0.54337	0.00253
2 0	−0.52565	+0.35737	+9.56306	+9.96884	30 44.7	+0.54339	−0.00250
10	0.43351	0.36396	9.56308	9.96883	33 14.7	0.54341	0.00248
20	0.34136	0.37054	9.56310	9.96883	35 44.7	0.54344	0.00246
30	0.24922	0.37712	9.56312	9.96883	38 14.7	0.54346	0.00243
40	0.15707	0.38368	9.56314	9.96882	40 44.7	0.54348	0.00241
50	−0.06492	0.39024	9.56317	9.96882	43 14.7	0.54350	0.00239
3 0	+0.02722	+0.39678	+9.56319	+9.96882	45 44.7	+0.54352	−0.00237
10	0.11937	0.40332	9.56321	9.96881	48 14.7	0.54354	0.00236
20	0.21151	0.40985	9.56323	9.96881	50 44.7	0.54356	0.00234
30	0.30366	0.41637	9.56325	9.96881	53 14.7	0.54357	0.00232
40	0.39580	0.42287	9.56327	9.96880	55 44.7	0.54359	0.00231
50	0.48794	0.42937	9.56329	9.96880	58 14.7	0.54361	0.00229
4 0	+0.58008	+0.43586	+9.56331	+9.96880	60 44.7	+0.54362	−0.00228
10	0.67222	0.44234	9.56334	9.96879	63 14.7	0.54364	0.00226
20	0.76436	0.44881	9.56336	9.96879	65 44.7	0.54365	0.00225
30	0.85650	0.45527	9.56338	9.96879	68 14.7	0.54366	0.00224
40	0.94863	0.46172	9.56340	9.96878	70 44.7	0.54367	0.00222
50	1.04076	0.46817	9.56342	9.96878	73 14.7	0.54368	0.00221
5 0	+1.13288	+0.47460	+9.56344	+9.96878	75 44.7	+0.54369	−0.00220
10	1.22501	0.48102	9.56346	9.96877	78 14.7	0.54370	0.00219
20	1.31713	0.48743	9.56348	9.96877	80 44.7	0.54371	0.00218
30	1.40925	0.49384	9.56351	9.96877	83 14.7	0.54372	0.00217
40	+1.50136	+0.50023	+9.56353	+9.96876	85 44.7	+0.54373	−0.00216

Greenwich Mean Time.	Log Δ *x* for 1 Minute.	Log Δ *y* for 1 Minute.	Log Δ *μ* for 1 Minute.	Log Tangents of Angles of Cones—	
				Penumbra.	Shadow.
h m					
0 0	+7.9643	+6.8266	+1.1761	+7.66391	+7.66174
1 0	7.9644	6.8230	1.1761	7.66390	7.66174
2 0	7.9645	6.8194	1.1761	7.66390	7.66174
3 0	7.9645	6.8157	1.1761	7.66390	7.66173
4 0	7.9644	6.8119	1.1761	7.66390	7.66173
5 0	+7.9644	+6.8081	+1.1761	+7.66389	+7.66173

PATH OF THE SHADOW DURING THE TOTAL ECLIPSE OF THE SUN, 1900, MAY 28.

Greenwich Mean Time.	Northern Limit of Shadow Path.		Central Line.		Southern Limit of Shadow Path.		Duration of Totality on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits.	+17 59.3	116 44.3 W.	+17 50.3	116 38.4 W.	+17 40.2	116 30.7 W.	
$1^h\ 15^m$	18 31.4	114 32.8	19 0.6	112 57.6	19 29.8	111 10.4	0 35.0
20	24 54.2	101 14.8	24 50.4	100 44.3	24 46.6	100 13.8	0 54.4
25	27 44.2	95 28.7	27 36.8	95 1.7	27 29.4	94 34.7	1 4.4
30	+29 56.3	91 5.1	+29 46.5	90 39.7	+29 36.7	90 14.3	1 12.6
35	31 47.7	87 22.8	31 36.0	86 58.2	31 24.3	86 33.6	1 19.6
40	33 25.0	84 5.2	33 11.8	83 41.4	32 58.6	83 17.6	1 26.0
45	34 51.9	81 4.1	34 37.3	80 41.1	34 22.7	80 18.1	1 31.7
50	36 10.3	78 14.6	35 54.4	77 52.4	35 38.5	77 30.2	1 37.0
55	37 21.7	75 33.5	37 4.6	75 12.1	36 47.5	74 50.7	1 41.9
2 0	+38 26.8	72 57.8	+38 8.7	72 37.3	+37 50.6	72 16.8	1 46.3
5	39 26.5	70 26.6	39 7.4	70 7.0	38 48.3	69 47.4	1 50.3
10	40 21.1	67 58.3	40 1.1	67 39.9	39 41.1	67 21.5	1 54.0
15	41 10.9	65 31.9	40 50.1	65 14.7	40 29.3	64 57.5	1 57.3
20	41 56.2	63 7.0	41 34.6	62 51.1	41 13.0	62 35.2	2 0.1
25	42 37.0	60 42.6	42 14.8	60 28.0	41 52.6	60 13.4	2 2.6
30	+43 13.7	58 18.4	+42 51.0	58 5.2	+42 28.3	57 52.0	2 4.6
35	43 46.1	55 53.7	43 23.0	55 42.2	42 59.9	55 30.7	2 6.3
40	44 14.5	53 28.0	43 51.0	53 18.3	43 27.5	53 8.6	2 7.5
45	44 39.1	51 1.3	44 15.2	50 53.4	43 51.3	50 45.5	2 8.6
50	44 59.6	48 33.6	44 35.4	48 27.5	44 11.2	48 21.4	2 8.7
55	45 15.8	46 4.9	44 51.4	46 0.7	44 27.0	45 56.5	2 8.8
3 0	+45 27.8	43 34.7	+45 3.3	43 32.4	+44 38.8	43 30.1	2 8.3
5	45 35.6	41 2.6	45 11.1	41 2.2	44 46.6	41 1.8	2 7.5
10	45 39.1	38 28.3	45 14.7	38 30.1	44 50.3	38 31.9	2 6.4
15	45 38.2	35 52.1	45 14.0	35 55.9	44 49.8	35 59.7	2 4.6
20	45 32.5	33 13.7	45 8.7	33 19.5	44 44.9	33 25.3	2 2.5
25	45 22.1	30 33.1	44 58.8	30 40.9	44 35.5	30 48.7	2 0.1
30	+45 7.0	27 49.2	+44 44.2	27 59.0	+44 21.4	28 8.8	1 57.2
35	44 46.8	25 2.5	44 24.7	25 14.1	44 2.6	25 25.7	1 53.9
40	44 21.1	22 12.1	43 59.8	22 25.5	43 38.5	22 38.9	1 50.2
45	43 49.6	19 17.6	43 29.2	19 32.7	43 8.8	19 47.8	1 46.1
50	43 12.1	16 17.9	42 52.7	16 34.6	42 33.3	16 51.3	1 41.7
55	42 27.9	13 12.0	42 9.6	13 30.1	41 51.3	13 48.2	1 36.9
4 0	+41 35.8	9 58.0	+41 18.8	10 17.5	+41 1.8	10 37.0	1 31.5
5	40 34.8	6 33.2	40 19.3	6 54.1	40 3.8	7 15.0	1 25.7
10	39 23.4	2 54.5 W.	39 9.5	3 16.5 W.	38 55.6	3 38.5 W.	1 19.4
15	37 59.1	1 4.9 E.	37 47.1	0 41.7 E.	37 35.1	0 18.5 E.	1 12.5
20	36 17.0	5 35.5	36 7.2	5 11.0	35 57.4	4 46.5	1 4.9
25	34 6.9	11 0.4	34 0.1	10 33.8	33 53.3	10 7.2	0 56.0
30	30 58.9	18 31.8	30 57.2	17 59.9	30 55.5	17 28.0	0 44.5
Limits.	+25 27.3	31 41.2 E.	+25 20.6	31 37.1 E.	+25 12.2	31 30.0 E.	

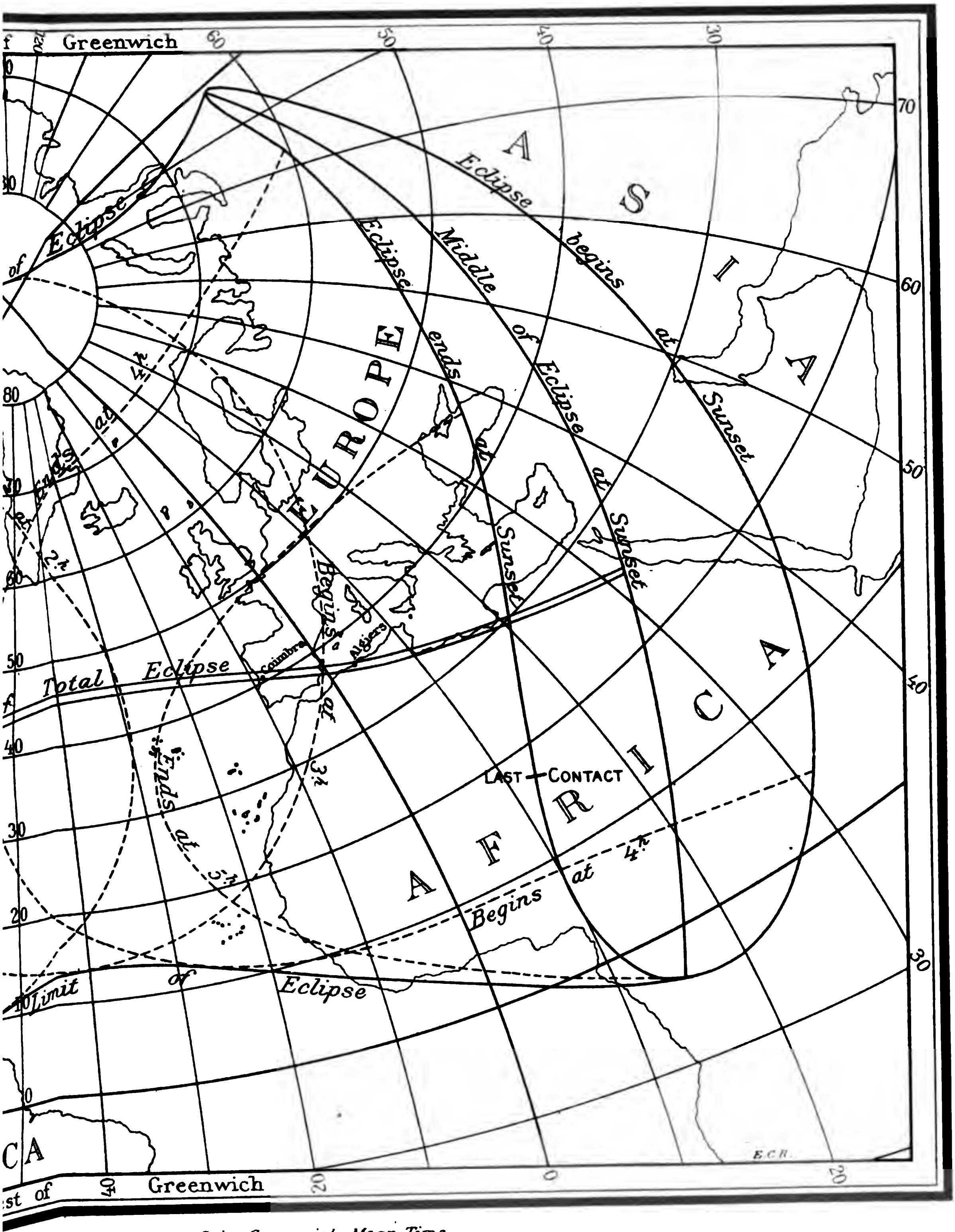
TOTAL ECLIPS



THE NORRIS PETERS CO. PHOTO-LITHO., WASHINGTON, D. C.

Note - *The hours of beginning and end*

E OF MAY 28TH 1900.



nd ending are expressed in Greenwich Mean Time.

BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, 1900, NOVEMBER 21.

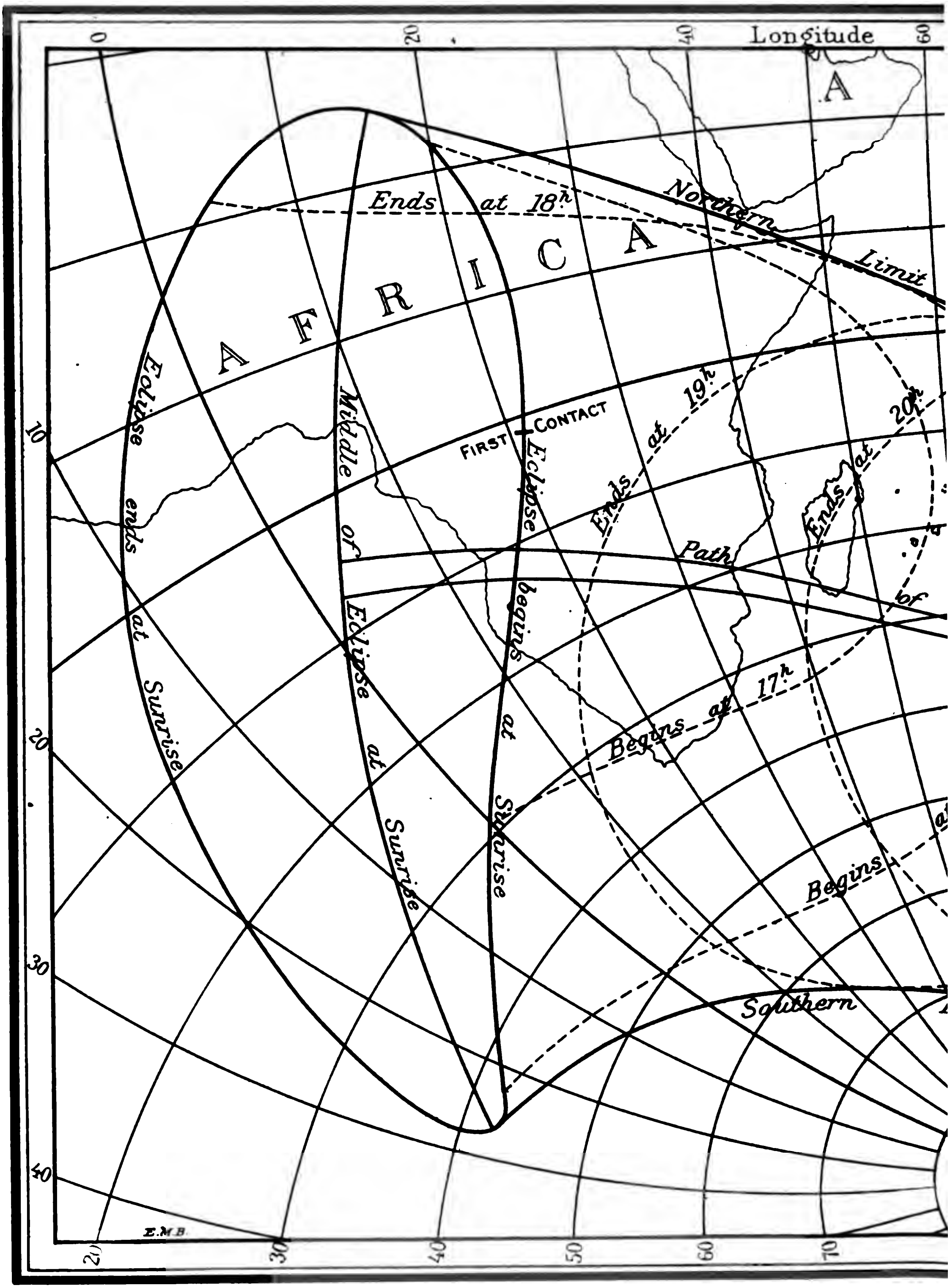
Greenwich Mean Time.	Co-ordinates of Centre of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	y	Log sin d	Log cos d	μ	l	l'
h m					° ′		
16 20	−1.56402	−0.04288	−9.53486	+9.97288	248 28.2	+0.56762	+0.02160
30	1.47851	0.05296	9.53489	9.97287	250 58.2	0.56761	0.02160
40	1.39298	0.06303	9.53492	9.97287	253 28.2	0.56761	0.02159
50	1.30745	0.07309	9.53495	9.97287	255 58.2	0.56760	0.02158
17 0	−1.22192	−0.08315	−9.53498	+9.97286	258 28.2	+0.56759	+0.02158
10	1.13638	0.09320	9.53501	9.97286	260 58.2	0.56759	0.02157
20	1.05084	0.10325	9.53504	9.97285	263 28.1	0.56758	0.02156
30	0.96530	0.11328	9.53508	9.97285	265 58.1	0.56757	0.02156
40	0.87975	0.12331	9.53511	9.97285	268 28.1	0.56756	0.02155
50	0.79420	0.13333	9.53514	9.97284	270 58.1	0.56755	0.02154
18 0	−0.70864	−0.14335	−9.53517	+9.97284	273 28.1	+0.56754	+0.02153
10	0.62308	0.15335	9.53520	9.97283	275 58.1	0.56753	0.02152
20	0.53752	0.16335	9.53523	9.97283	278 28.1	0.56752	0.02150
30	0.45195	0.17334	9.53526	9.97283	280 58.0	0.56751	0.02149
40	0.36639	0.18333	9.53529	9.97282	283 28.0	0.56750	0.02148
50	0.28082	0.19330	9.53532	9.97282	285 58.0	0.56749	0.02147
19 0	−0.19525	−0.20327	−9.53535	+9.97281	288 28.0	+0.56747	+0.02146
10	0.10967	0.21324	9.53538	9.97281	290 58.0	0.56746	0.02144
20	−0.02410	0.22319	9.53541	9.97281	293 28.0	0.56744	0.02143
30	+0.06148	0.23313	9.53545	9.97280	295 58.0	0.56743	0.02141
40	0.14706	0.24307	9.53548	9.97280	298 27.9	0.56741	0.02140
50	0.23264	0.25300	9.53551	9.97279	300 57.9	0.56740	0.02138
20 0	+0.31822	−0.26292	−9.53554	+9.97279	303 27.9	+0.56738	+0.02136
10	0.40380	0.27284	9.53557	9.97279	305 57.8	0.56736	0.02134
20	0.48938	0.28275	9.53560	9.97278	308 27.8	0.56734	0.02133
30	0.57496	0.29264	9.53563	9.97278	310 57.8	0.56732	0.02131
40	0.66054	0.30253	9.53566	9.97277	313 27.8	0.56730	0.02129
50	0.74612	0.31242	9.53569	9.97277	315 57.8	0.56728	0.02127
21 0	+0.83170	−0.32229	−9.53572	+9.97276	318 27.8	+0.56726	+0.02125
10	0.91729	0.33216	9.53575	9.97276	320 57.8	0.56724	0.02123
20	1.00287	0.34202	9.53578	9.97276	323 27.8	0.56722	0.02121
30	1.08845	0.35187	9.53582	9.97275	325 57.8	0.56720	0.02119
40	1.17403	0.36172	9.53585	9.97275	328 27.8	0.56718	0.02116
50	1.25961	0.37155	9.53588	9.97274	330 57.8	0.56715	0.02114
22 0	+1.34519	−0.38138	−9.53591	+9.97274	333 27.7	+0.56713	+0.02112
10	1.43077	0.39120	9.53594	9.97274	335 57.7	0.56710	0.02109
20	+1.51635	−0.40101	−9.53597	+9.97273	338 27.7	+0.56708	+0.02106

Greenwich Mean Time.	Log Δx for 1 Minute.	Log Δy for 1 Minute.	Log $\Delta \mu$ for 1 Minute.	Log Tangents of Angles of Cones—	
				Penumbra.	Shadow.
h m					
16 0	+7.9320	−7.0043	+1.1761	+7.67545	+7.67328
17 0	7.9322	7.0024	1.1761	7.67545	7.67329
18 0	7.9323	7.0005	1.1761	7.67546	7.67329
19 0	7.9324	6.9985	1.1761	7.67546	7.67329
20 0	7.9324	6.9964	1.1761	7.67546	7.67330
21 0	7.9324	6.9944	1.1761	7.67546	7.67330
22 0	+7.9323	−6.9923	+1.1761	+7.67547	+7.67330

PATH OF THE ANNULUS DURING THE ANNULAR ECLIPSE OF THE SUN, 1900, NOVEMBER 21.

Greenwich Mean Time.	Northern Limit of Annulus Path.		Central Line.		Southern Limit of Annulus Path.		Duration of Annulus on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits.	− 4 47.0	3 21.3 E.	− 5 59.7	2 41.1 E.	− 7 8.8	1 59.7 E.	
17^h 30^m	10 28.3	17 0.6	10 50.7	14 41.6	11 13.1	12 22.6	5 1.4
35	13 11.9	22 39.1	13 47.9	21 1.5	14 23.9	19 23.9	5 12.3
40	15 16.3	26 43.1	15 57.2	25 21.7	16 38.1	24 0.3	5 21.2
45	17 0.9	30 1.6	17 44.4	28 49.3	18 27.9	27 37.0	5 28.9
50	18 32.4	32 52.1	19 17.7	31 46.1	20 3.0	30 40.1	5 36.0
55	19 54.3	35 24.0	20 40.9	34 22.9	21 27.5	33 21.8	5 42.5
18 0	−21 8.7	37 42.0	−21 56.3	36 45.0	−22 43.9	35 48.0	5 48.7
5	22 17.0	39 49.7	23 5.6	38 56.1	23 54.2	38 2.5	5 54.6
10	23 20.4	41 49.8	24 9.8	40 59.2	24 59.2	40 8.6	6 0.1
15	24 19.1	43 44.1	25 9.3	42 56.3	25 59.5	42 8.5	6 5.3
20	25 13.8	45 33.6	26 4.7	44 48.4	26 55.6	44 3.2	6 10.3
25	26 4.7	47 18.9	26 56.3	46 36.3	27 47.9	45 53.7	6 15.0
30	−26 52.2	49 1.1	−27 44.4	48 21.0	−28 36.6	47 40.9	6 19.5
35	27 36.4	50 41.1	28 29.3	50 3.4	29 22.2	49 25.7	6 23.6
40	28 17.7	52 19.5	29 11.2	51 44.1	30 4.7	51 8.7	6 27.3
45	28 56.1	53 56.7	29 50.3	53 23.7	30 44.5	52 50.7	6 30.7
50	29 31.9	55 33.1	30 26.7	55 2.4	31 21.5	54 31.7	6 33.7
55	30 4.9	57 8.9	31 0.3	56 40.6	31 55.7	56 12.3	6 36.4
19 0	−30 35.3	58 44.3	−31 31.2	58 18.5	−32 27.1	57 52.7	6 38.7
5	31 2.9	60 19.7	31 59.4	59 56.4	32 55.9	59 33.1	6 40.6
10	31 28.0	61 55.2	32 25.1	61 34.6	33 22.2	61 14.0	6 42.2
15	31 50.7	63 31.2	32 48.3	63 13.4	33 45.9	62 55.6	6 43.2
20	32 10.8	65 8.0	33 8.8	64 53.0	34 6.8	64 38.0	6 43.7
25	32 28.1	66 46.1	33 26.5	66 33.8	34 24.9	66 21.5	6 43.6
30	−32 42.8	68 25.6	−33 41.6	68 16.1	−34 40.4	68 6.6	6 42.9
35	32 54.8	70 6.4	33 54.1	69 59.8	34 53.4	69 53.2	6 41.9
40	33 4.2	71 48.7	34 3.8	71 45.0	35 3.4	71 41.3	6 40.6
45	33 10.9	73 32.7	34 10.7	73 32.1	35 10.5	73 31.5	6 38.8
50	33 14.7	75 18.9	34 14.6	75 21.6	35 14.5	75 24.3	6 36.5
55	33 15.4	77 7.6	34 15.4	77 13.7	35 15.4	77 19.8	6 33.7
20 0	−33 13.0	78 59.1	−34 13.0	79 8.6	−35 13.0	79 18.1	6 30.4
5	33 7.3	80 53.6	34 7.3	81 6.6	35 7.3	81 19.6	6 26.7
10	32 58.1	82 51.6	33 58.1	83 8.3	34 58.1	83 25.0	6 22.7
15	32 45.3	84 53.6	33 45.1	85 14.1	34 44.9	85 34.6	6 18.2
20	32 28.5	87 0.3	33 28.0	87 24.7	34 27.5	87 49.1	6 13.1
25	32 7.4	89 12.5	33 6.5	89 40.9	34 5.6	90 9.3	6 7.7
30	−31 41.6	91 31.0	−32 40.2	92 3.8	−33 38.8	92 36.6	6 2.2
35	31 10.4	93 57.1	32 8.4	94 34.7	33 6.4	95 12.3	5 56.2
40	30 33.3	96 32.7	31 30.5	97 15.4	32 27.7	97 58.1	5 49.5
45	29 49.1	99 20.0	30 45.3	100 8.5	31 41.5	100 57.0	5 42.6
50	28 56.3	102 22.6	29 51.1	103 18.0	30 45.9	104 13.4	5 35.2
55	27 52.7	105 46.4	28 45.4	106 50.3	29 38.1	107 54.2	5 27.4
21 0	−26 34.4	109 41.3	−27 23.9	110 56.9	−28 13.4	112 12.5	5 18.8
5	24 53.2	114 26.9	25 36.8	116 1.8	26 20.4	117 36.7	5 9.1
10	22 27.7	120 58.0	22 53.7	123 25.7	23 19.7	125 53.4	4 56.6
Limits.	−17 17.3	134 36.6 E.	−18 26.8	135 19.4 E.	−19 35.8	136 2.1 E.	

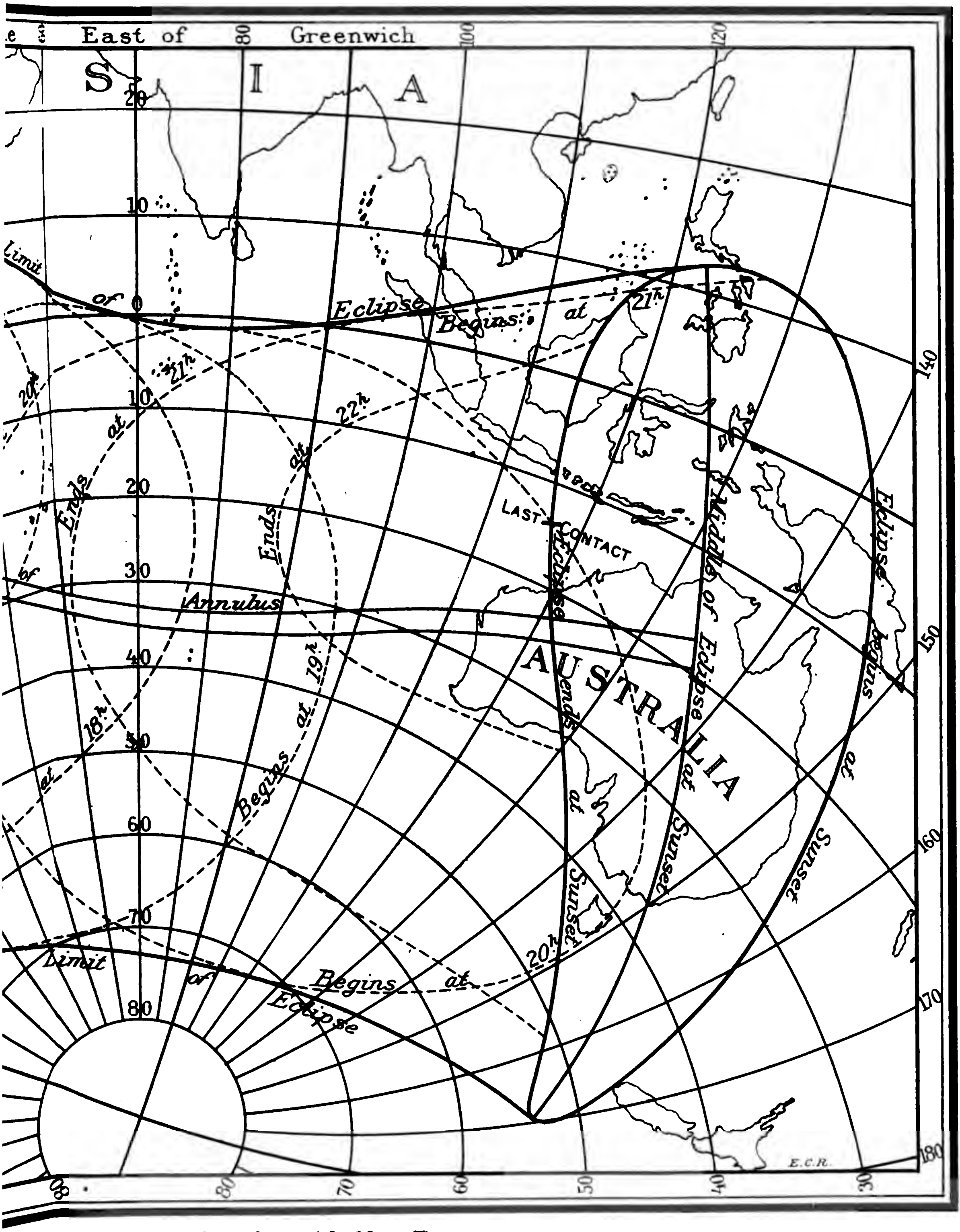
ANNULAR ECLIPSE O



THE NORRIS PETERS CO., PHOTO-LITHO. WASHINGTON D. C.

Note- *The hours of beginning and end*

E OF NOVEMBER 21ST 1900.



ending are expressed in Greenwich Mean Time.

WASHINGTON MEAN TIME.

PHASES OF THE MOON.

New Moon.	d	h	m	First Quarter.	d	h	m	Full Moon.	d	h	m	Last Quarter.	d	h	m
				January	7	12	31.6	January	15	1	59.3	January	23	6	44.6
January	30	8	14.3	February	5	23	14.8	February	13	20	42.0	February	21	23	35.9
February	28	18	16.9	March	7	12	26.1	March	15	15	3.5	March	23	12	28.2
March	30	3	22.2	April	6	3	46.4	April	14	7	53.8	April	21	21	25.1
April	28	12	15.0	May	5	20	30.7	May	13	22	28.3	May	21	3	22.6
May	27	21	41.5	June	4	13	50.5	June	12	10	30.2	June	19	7	49.1
June	26	8	19.1	July	4	7	5.3	July	11	20	13.6	July	18	12	23.1
July	25	20	34.6	August	2	23	37.3	August	10	4	21.6	August	16	18	38.0
August	24	10	44.3	September	1	14	47.5	September	8	11	57.9	September	15	3	48.9
September	23	2	48.8	October	1	4	2.4	October	7	20	9.9	October	14	16	42.6
October	22	20	19.0	October	30	15	9.2	November	6	5	51.5	November	13	9	29.2
November	21	14	8.9	November	29	0	26.8	December	5	17	30.0	December	13	5	33.9
December	21	6	53.0	December	28	8	39.7								

APOGEE, PERIGEE, AND GREATEST LIBRATION.

Perigee.	d	h	Apogee.	d	h	Greatest Libration.	d	h	m			d	h	m	
January	2	23.8	January	18	23.8	January	10	1	48	W.	January	25	11	3	E.
January	31	7.1	February	15	7.9	February	6	15	38	W.	February	22	18	8	E.
February	28	19.0	March	14	8.1	March	6	20	15	W.	March	22	21	37	E.
March	29	6.2	April	10	17.0	April	4	3	1	W.	April	19	11	45	E.
April	26	11.9	May	8	9.2	May	2	6	18	W.	May	15	23	6	E.
May	24	0.9	June	5	3.7	May	30	0	48	W.	June	11	13	18	E.
June	18	9.0	July	2	22.3	June	26	3	41	W.	July	8	23	45	E.
July	14	20.5	July	30	15.6	July	22	11	36	W.	August	5	22	1	E.
August	11	18.0	August	27	5.4	August	18	10	28	W.	September	3	2	27	E.
September	9	1.3	September	23	11.0	September	15	6	49	W.	October	1	8	36	E.
October	7	12.6	October	20	13.5	October	13	11	43	W.	October	29	10	8	E.
November	4	23.2	November	17	1.5	November	10	18	3	W.	November	25	15	30	E.
December	3	2.7	December	14	20.3	December	8	20	21	W.	December	21	18	6	E.
December	29	22.8													

FORMULÆ FOR THE LIBRATION OF THE MOON.

Put I, the inclination of the moon's equator to the ecliptic ($=1^\circ\ 28'.8$),

☊, the mean longitude of the moon's ascending node, or the mean longitude of the descending node of the moon's equator,

C, the angle at the centre of the moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,

λ, β, α', δ' the apparent longitude, latitude, right ascension, and declination of the moon, corrected for parallax,

λ', the selenocentric longitude of the earth, counted on the moon's equator from its descending node, ☊,

i, $\triangle$, ☊$'$, ☾, the quantities defined on page 284, where their values for the year are given.

The moon's libration in longitude and latitude may then be found, for any time, by means of the following formulæ, in connection with the tables given on pages 284 and 285:—

$$\left.\begin{aligned} \triangle\lambda &= -0'.57 \sin 2\,(\text{☊} - \lambda) \\ a &= \sin I \cos\,(\text{☊} - \lambda) \\ \tan B &= \tan I \sin\,(\text{☊} - \lambda) \\ \lambda' &= \lambda + \triangle\lambda + a\,b \end{aligned}\right\}\ \textit{See table, page 285.}$$

$$\text{The libration in latitude} \quad = b = B - \beta$$

$$\text{The libration in longitude} \quad = l = \lambda' - \text{☾}$$

$$\sin C = \sin i\,\frac{\cos\,(\lambda' + \triangle - \text{☊})}{\cos\delta'} = -\sin i\,\frac{\cos\,(\alpha' - \text{☊}')}{\cos b}$$

MEAN PLACES FOR 1900.0. (January $0^d.0+0^d.102$, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
36 Piscium	6.3	0 11 25.707	−0.0025	+ 7 41 5.78	−0.009
d Piscium	5.3	0 15 27.082	−0.0001	7 38 5.40	+0.011
45 Piscium	6.9	0 20 32.530	+0.0015	7 8 17.98	−0.053
75 Piscium	6.0	1 1 17.953	+0.0014	12 25 12.13	+0.031
101 Piscium	6.3	1 30 25.516	−0.0005	14 9 0.78	−0.015
104 Piscium	7.5	1 33 53.951	+0.0066	+13 46 40.94	−0.036
27 Arietis	6.3	2 25 21.534	+0.0026	17 15 41.54	−0.096
B. A. C. 782	7.0	2 28 0.897	+0.0050	18 26 20.80	+0.008
μ Arietis	6.0	2 36 43.585	+0.0018	19 35 7.10	−0.055
36 Arietis	6.5	2 38 44.231	+0.0037	17 20 26.94	−0.038
40 Arietis	6.3	2 42 55.661	+0.0025	+17 52 2.18	−0.037
π Arietis	5.7	2 43 42.626	0.0000	17 2 54.92	−0.008
ρ^1 Arietis	7.0	2 49 18.842	+0.0021	17 20 40.79	−0.030
ρ^2 Arietis	6.0	2 50 11.240	−0.0015	17 55 35.75	−0.015
ρ^3 Arietis	6.0	2 50 47.372	+0.0190	17 37 28.87	−0.195
47 Arietis	6.0	2 52 21.681	+0.0152	+20 16 4.00	−0.029
50 Arietis	6.8	2 55 55.986	−0.0020	17 36 28.59	−0.021
53 Arietis	6.3	3 1 47.758	−0.0030	17 29 39.15	+0.006
54 Arietis	6.3	3 2 40.799	+0.0002	18 24 41.13	−0.016
δ Arietis	4.0	3 5 54.538	+0.0099	19 26 55.20	−0.003
τ_1 Arietis	5.0	3 15 27.174	+0.0028	+20 47 11.55	−0.044
τ_2 Arietis	5.3	3 16 59.851	−0.0036	20 23 3.87	−0.017
65 Arietis	6.0	3 18 40.076	−0.0002	20 20 59.54	−0.006
B. A. C. 1055	6.8	3 18 45.746	+0.0048	21 41 16.49	....
13 Tauri	5.7	3 36 32.836	0.0000	19 22 47.71	−0.024
14 Tauri	6.3	3 38 0.226	+0.0081	+19 20 56.86	−0.042
B. A. C. 1143	6.0	3 38 38.929	−0.0018	20 36 47.71	−0.001
B. A. C. 1189	6.0	3 44 2.2	.....	21 56 28.1	....
32 Tauri	6.0	3 50 57.399	+0.0030	22 11 24.10	−0.111
33 Tauri	6.3	3 51 8.151	+0.0044	22 53 6.33	−0.020
B. A. C. 1238	6.3	3 55 0.357	−0.0003	+22 55 11.59	−0.025
B. A. C. 1242	6.3	3 55 17.290	+0.0005	19 55 9.87	−0.059
A^2 Tauri	6.3	3 59 25.004	+0.0126	21 44 21.39	−0.128
ω^2 Tauri	5.7	4 11 23.994	−0.0035	20 19 57.67	−0.047
51 Tauri	6.0	4 12 28.059	+0.0067	21 20 5.73	−0.037
53 Tauri	6.0	4 13 32.384	+0.0021	+20 54 1.27	−0.053
56 Tauri	6.0	4 13 41.392	+0.0016	21 31 54.45	−0.052
χ^1 Tauri	4.7	4 19 24.442	+0.0064	22 3 54.33	−0.052
χ^2 Tauri	6.3	4 19 27.591	+0.0087	21 58 16.47	−0.056
υ^1 Tauri	4.7	4 20 19.496	+0.0109	22 35 12.62	−0.045
υ^2 Tauri	6.0	4 21 18.554	−0.0003	+22 46 15.37	−0.016
B. A. C. 1373	6.0	4 22 4.632	+0.0082	21 23 48.66	−0.067
W. 4^h, 650	6.0	4 32 21.7	.....	20 29 2.2	....
95 Tauri	6.3	4 37 10.453	+0.0007	23 53 57.78	−0.026
B. A. C. 1463	6.3	4 39 40.134	−0.0004	23 26 40.2	....
99 Tauri	6.0	4 51 44.533	−0.0005	+23 47 32.10	−0.026
ι Tauri	5.0	4 57 7.054	+0.0044	+21 26 49.40	−0.052

MEAN PLACES FOR 1900.0. (January 0^d.0+0^d.102, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
l Tauri	5.7	5 1 53.288	−0.0035	+20 17 11.97	−0.034
105 Tauri	6.0	5 1 56.753	−0.0005	21 34 20.73	−0.019
103 Tauri	6.0	5 2 0.943	−0.0006	24 7 58.79	−0.011
108 Tauri	6.3	5 9 26.971	−0.0015	22 10 14.69	−0.008
n Tauri	5.7	5 13 16.099	+0.0016	21 59 35.26	−0.083
o Tauri	6.0	5 21 37.725	+0.0006	+21 51 5.63	−0.013
121 Tauri	6.0	5 29 20.665	+0.0002	23 58 22.56	−0.031
ζ Tauri	3.3	5 31 40.112	+0.0002	21 4 53.13	−0.039
B. A. C. 1801	6.0	5 37 15.1	.....	23 9 27.5	....
B. A. C. 1867	7.2	5 47 22.486	+0.0009	20 16 28.89	−0.094
χ^1 Orionis	4.7	5 48 27.636	−0.0135	+20 15 26.77	−0.102
140 Tauri	7.0	5 54 24.416	−0.0010	22 53 39.08	−0.006
141 Tauri	6.7	5 55 39.235	−0.0020	22 23 52.58	−0.026
χ^4 Orionis	5.0	5 57 58.766	−0.0018	20 8 26.90	−0.008
1 Geminorum	5.0	5 58 2.497	0.0000	23 16 7.82	−0.102
3 Geminorum	6.3	6 3 39.568	−0.0001	+23 7 46.61	−0.014
4 Geminorum	7.4	6 4 26.042	−0.0005	23 0 50.13	−0.064
68 Orionis	6.0	6 6 6.051	+0.0025	19 48 45.53	−0.026
6 Geminorum	6.7	6 6 13.368	−0.0004	22 55 52.84	0.000
14 Geminorum	7.2	6 19 42.617	−0.0019	21 42 0.91	−0.027
15 Geminorum (2^d star)	7.0	6 21 48.978	−0.0030	+20 51 3.52	−0.047
16 Geminorum	6.8	6 21 59.832	−0.0025	20 33 22.90	−0.005
22 Geminorum	7.2	6 28 45.146	−0.0016	19 30 22.37	−0.002
d Geminorum	6.0	6 45 33.511	−0.0007	21 52 44.25	−0.049
56 Geminorum	5.7	7 16 2.862	−0.0048	20 37 56.92	−0.021
61 Geminorum	6.0	7 21 2.714	−0.0013	+20 27 26.02	−0.025
f Geminorum	6.0	7 33 42.074	−0.0011	17 54 8.58	+0.006
g Geminorum	5.3	7 40 20.115	−0.0055	18 45 14.70	−0.058
1 Cancri	6.3	7 51 18.872	−0.0021	16 3 26.94	−0.048
B. A. C. 2658	7.2	7 54 55.342	0.0000	18 31 11.46	+0.003
3 Cancri	6.0	7 55 3.532	−0.0014	+17 34 57.34	−0.023
5 Cancri	6.3	7 55 48.432	+0.0010	16 43 51.24	−0.016
29 Cancri	6.0	8 23 2.539	−0.0021	14 32 30.53	−0.025
A^1 Cancri	6.0	8 37 41.757	−0.0003	13 2 21.94	−0.006
A^2 Cancri	6.0	8 41 27.171	−0.0055	12 28 37.40	−0.053
60 Cancri	6.0	8 50 28.017	−0.0008	+12 0 29.41	−0.018
a^2 Cancri	4.0	8 53 1.132	+0.0019	12 14 41.31	−0.041
ω Leonis	5.9	9 23 6.189	+0.0035	9 29 32.33	−0.006
h Leonis	5.7	9 26 36.066	+0.0006	10 9 24.46	−0.012
11 Sextantis	6.0	9 52 49.794	+0.0003	8 47 28.81	−0.032
14 Sextantis	6.6	10 1 33.682	−0.0036	+ 6 5 57.25	−0.005
16 Sextantis	6.9	10 4 0.560	+0.0006	6 39 39.60	−0.013
19 Sextantis	6.2	10 7 36.154	−0.0050	5 6 31.94	−0.001
34 Sextantis	6.7	10 37 27.655	−0.0069	5 6 19.62	+0.016
36 Sextantis	6.6	10 40 0.312	−0.0041	3 0 50.26	−0.016
55 Leonis	6.2	10 50 33.732	+0.0065	+ 1 16 11.76	−0.014
57 Leonis	6.9	10 51 2.865	+0.0011	+ 0 57 58.49	−0.022

MEAN PLACES FOR 1900.0. (January $0^d.0+0^d.102$, Washington.)

Name of Star.	Magnitude.	Right Ascension.			Annual Proper Motion.	Declination.			Annual Proper Motion.
		h	m	s	s	°	′	″	″
p^3 Leonis	5.4	10	58	29.404	−0.0059	+ 0	32	14.85	−0.013
p^4 Leonis	6.9	11	4	7.442	−0.0013	− 0	47	28.50	−0.003
p^5 Leonis	5.7	11	8	38.483	−0.0026	+ 0	28	27.94	−0.012
e Leonis	5.3	11	25	12.307	+0.0009	− 2	27	6.28	−0.013
B. A. C. 4006	6.1	11	45	55.645	+0.0029	4	46	39.03	−0.022
q Virginis	5.7	12	28	36.973	−0.0070	− 8	54	2.58	−0.014
χ Virginis	5.2	12	34	5.021	−0.0058	7	26	43.90	−0.043
ψ Virginis	5.2	12	49	9.060	−0.0026	8	59	45.88	−0.034
g Virginis	5.9	13	2	39.416	+0.0005	10	12	20.47	−0.013
i Virginis	5.7	13	21	26.099	−0.0099	12	11	15.65	−0.041
75 Virginis	6.0	13	27	31.094	−0.0029	−14	50	55.54	−0.012
83 Virginis	6.0	13	39	6.057	+0.0006	15	40	35.69	−0.031
85 Virginis	6.5	13	40	11.839	−0.0051	15	15	54.57	−0.043
B. A. C. 4700	5.6	14	5	23.813	+0.0028	15	49	46.73	−0.009
B. A. C. 4722	5.8	14	9	53.392	−0.0027	17	44	3.56	−0.015
B. A. C. 4896	6.6	14	45	59.186	−0.0040	−17	22	26.76	−0.114
10 Libræ	6.5	14	46	14.518	−0.0040	17	56	36.23	−0.008
ι^1 Libræ	5.0	15	6	31.144	−0.0041	19	24	28.24	−0.050
ι^2 Libræ	6.5	15	7	37.302	−0.0043	19	16	14.95	−0.034
B. A. C. 5109	6.2	15	26	52.027	−0.0015	19	19	47.09	−0.027
41 Libræ	5.9	15	33	9.064	+0.0062	−18	58	21.11	−0.074
κ Libræ	5.5	15	36	10.966	−0.0044	19	21	17.13	−0.114
λ Libræ	5.5	15	47	33.614	−0.0023	19	52	5.81	−0.036
ω^1 Scorpii	4.6	16	0	57.374	−0.0018	20	23	54.97	−0.040
ω^2 Scorpii	4.6	16	1	32.374	+0.0020	20	35	56.03	−0.067
B. A. C. 5395	7.0	16	7	47.649	−0.0083	−21	8	39.93	+0.029
ρ Ophicuhi (south star)	5.0	16	19	35.223	−0.0017	23	13	0.94	−0.042
ω Ophiuchi	4.7	16	26	12.488	+0.0010	21	15	9.07	+0.028
15 Ophiuchi	7.3	16	39	7.517	−0.0048	22	59	51.38	−0.005
22 Ophiuchi	6.7	16	48	48.176	−0.0010	23	20	54.33	−0.052
24 Ophiuchi	5.9	16	50	46.102	−0.0001	−22	59	28.83	−0.006
B. A. C. 5758	6.6	17	0	13.468	−0.0041	21	25	34.75	−0.107
ξ Ophiuchi	5.1	17	15	0.666	+0.0167	21	0	18.96	−0.191
52 Ophiuchi	6.5	17	29	17.480	−0.0022	21	58	36.70	−0.050
B. A. C. 5954	6.8	17	32	44.358	−0.0031	21	51	13.97	−0.045
58 Ophiuchi	5.4	17	37	26.287	−0.0064	−21	58	5.11	−0.063
B. A. C. 6098	6.0	17	56	39.286	−0.0030	20	44	13.11	−0.031
Piazzi 17^h, 330	5.3	17	57	33.3	.....	23	8	25.61	....
Piazzi 17^h, 334	5.3	17	57	52.113	−0.0023	22	50	22.42	0.000
14 Sagittarii	6.0	18	8	15.222	−0.0038	21	44	23.24	−0.034
15 Sagittarii	5.8	18	9	14.952	−0.0005	−20	45	29.04	−0.004
16 Sagittarii	6.6	18	9	15.966	−0.0010	20	25	4.76	−0.025
17 Sagittarii	7.0	18	10	37.825	−0.0029	20	34	38.99	−0.030
21 Sagittarii	5.1	18	19	23.680	−0.0008	20	35	42.52	−0.023
B. A. C. 6336	6.2	18	31	55.161	−0.0029	21	28	51.16	−0.107
B. A. C. 6347	6.0	18	32	55.619	−0.0063	−21	8	4.86	−0.156
28 Sagittarii	5.6	18	40	18.734	+0.0006	−22	29	50.26	−0.022

MEAN PLACES FOR 1900.0. (January $0^d.0+0^d.102$, Washington.)

Name of Star.	Magnitude.	Right Ascension.			Annual Proper Motion.	Declination.			Annual Proper Motion.
		h	m	s	s	°	′	″	″
B. A. C. 6386 . .	7.3	18	41	56.389	−0.0008	−20	22	59.53	−0.034
29 Sagittarii . . .	5.5	18	43	44.075	−0.0008	20	26	18.85	+0.014
30 Sagittarii . . .	6.6	18	44	49.763	−0.0050	22	16	36.71	−0.038
31 Sagittarii . . .	7.0	18	46	7.924	−0.0003	22	2	19.89	−0.044
33 Sagittarii . . .	6.0	18	48	1.517	−0.0005	21	28	55.43	−0.006
ξ^1 Sagittarii . . .	5.7	18	51	23.908	−0.0020	−20	47	14.54	−0.029
ξ^2 Sagittarii . . .	3.5	18	51	45.876	+0.0019	21	14	17.19	−0.022
Lalande 35497 . .	6.4	18	57	11.1	.....	19	23	25.4	....
B. A. C. 6536 . .	5.8	19	2	24.152	−0.0011	19	26	49.1	....
π Sagittarii . . .	3.1	19	3	49.036	−0.0014	21	10	57.68	−0.044
ρ^1 Sagittarii . . .	4.2	19	15	52.416	−0.0026	−18	2	8.92	−0.005
ρ^2 Sagittarii . . .	6.5	19	16	1.011	+0.0071	18	29	37.25	−0.091
B. A. C. 6658 . .	7.3	19	22	16.2	.....	18	33	40.05	+0.025
B. A. C. 6707 . .	6.4	19	30	36.402	+0.0016	19	4	24.40	−0.003
B. A. C. 6710 . .	5.8	19	31	15.329	+0.0022	18	27	14.07	−0.056
e^1 Sagittarii . . .	5.5	19	34	59.674	+0.0042	−16	31	21.90	−0.054
e^2 Sagittarii . . .	5.4	19	36	47.985	+0.0041	16	21	30.38	−0.020
57 Sagittarii . . .	6.1	19	46	23.438	+0.0004	19	17	56.78	−0.066
g Sagittarii . . .	5.3	19	52	16.728	−0.0004	15	45	24.46	−0.089
B. A. C. 6992 . .	6.7	20	15	9.465	+0.0012	15	6	1.05	−0.004
β Capricorni . . .	3.2	20	15	23.606	+0.0019	−15	5	50.31	−0.003
B. A. C. 7087 . .	6.3	20	28	37.323	−0.0002	14	3	53.19	+0.052
τ^1 Capricorni . . .	7.0	20	31	44.884	+0.0052	15	29	37.62	−0.040
τ^2 Capricorni . . .	5.6	20	33	40.916	+0.0001	15	18	20.59	−0.029
8 Aquarii . . .	6.8	20	54	25.131	−0.0030	13	26	27.33	−0.012
9 Aquarii . . .	6.8	20	55	37.684	−0.0017	−13	55	17.13	−0.013
ν Aquarii . . .	4.7	21	4	8.852	+0.0055	11	46	36.00	−0.016
B. A. C. 7408 . .	6.9	21	16	36.586	0.0000	9	45	9.3	....
17 Aquarii . . .	6.2	21	17	34.538	−0.0041	9	44	44.31	−0.030
19 Aquarii . . .	5.8	21	19	50.581	−0.0008	10	10	27.53	−0.170
B. A. C. 7562 . .	5.5	21	39	35.375	+0.0047	− 9	29	47.06	0.000
c^1 Capricorni . . .	5.5	21	39	40.342	−0.0005	9	32	30.57	−0.005
c^2 Capricorni . . .	6.4	21	40	56.146	−0.0008	9	44	15.72	−0.007
30 Aquarii . . .	5.8	21	58	0.846	+0.0015	7	0	20.83	+0.001
B. A. C. 7744 . .	6.7	22	7	31.470	−0.0038	5	12	49.45	−0.026
B. A. C. 7752 . .	6.7	22	8	39.425	+0.0072	− 4	56	49.3	....
44 Aquarii . . .	6.4	22	12	53.241	−0.0014	5	53	11.25	+0.031
51 Aquarii . . .	5.8	22	18	54.374	+0.0012	5	20	35.74	−0.020
κ Aquarii . . .	5.2	22	32	34.718	−0.0051	4	44	38.05	−0.122
Lalande 44337 . .	6.3	22	35	36.8	.....	4	4	23.3	....
3 Piscium . . .	6.4	22	55	29.981	−0.0031	− 0	21	2.54	+0.021
κ Piscium . . .	4.7	23	21	48.343	+0.0046	+ 0	42	28.35	−0.111
9 Piscium . . .	6.6	23	22	7.484	+0.0032	0	34	22.17	−0.051
16 Piscium . . .	5.8	23	31	17.098	−0.0080	1	32	50.02	+0.056
19 Piscium . . .	4.9	23	41	16.871	−0.0039	+ 2	55	54.90	−0.032

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
8 Aquarii	6.8	−0.02	+2.3	−13 26.4	8 0 18.7	− 1 44.1	+0.3054	0.5779	+0.2011	+49	−21
9 Aquarii	6.8	−0.02	2.2	13 55.2	0 49.1	− 1 14.9	+0.8847	0.5776	0.2018	+76	+11
ν Aquarii	4.7	0.00	2.6	11 46.6	4 23.9	+ 2 12.0	−0.5150	0.5759	0.2064	+ 7	−72
19 Aquarii	5.8	+0.05	2.9	10 10.4	11 2.9	+ 8 36.4	−0.7085	0.5725	0.2141	− 2	−90
B. A. C. 7562	5.5	0.12	3.0	9 29.7	19 31.2	− 7 13.6	+0.4675	0.5684	0.2222	+65	−14
c^1 Capricorni	5.5	+0.12	+3.0	− 9 32.5	19 33.4	− 7 11.6	+0.5204	0.5684	+0.2223	+68	−11
c^2 Capricorni	6.4	0.12	3.0	9 44.2	20 6.2	− 6 39.9	+0.8369	0.5682	0.2227	+80	+ 7
30 Aquarii	5.8	0.19	3.6	7 0.3	4 3 31.8	+ 0 29.8	−0.2061	0.5648	0.2283	+26	−51
B. A. C. 7744	6.7	0.23	4.0	5 12.8	7 42.1	+ 4 31.3	−1.0343	0.5631	0.2307	−21	−90
44 Aquarii	6.4	0.25	3.8	5 53.1	9 37.4	+ 6 22.5	+0.0804	0.5623	0.2317	+43	−34
51 Aquarii	5.8	+0.28	+4.0	− 5 20.5	12 43.5	+ 9 22.1	+0.2598	0.5611	+0.2337	+53	−25
κ Aquarii	5.2	0.33	4.2	4 44.6	18 48.0	− 8 46.1	+1.0856	0.5590	0.2352	+85	+24
Lalande 44337	6.3	0.35	4.3	4 4.3	20 9.3	− 7 27.6	+0.7346	0.5585	0.2356	+84	+ 1
3 Piscium	6.4	0.44	5.4	− 0 21.0	5 5 4.6	+ 1 9.2	−0.8878	0.5565	0.2367	−10	−90
κ Piscium	4.7	0.57	5.6	+ 0 42.6	16 58.7	−11 21.0	+0.8678	0.5535	0.2355	+90	+ 9
9 Piscium	6.6	+0.58	+5.6	+ 0 34.5	17 7.5	−11 12.5	+1.0382	0.5535	+0.2354	+90	+20
16 Piscium	5.8	0.63	5.9	1 32.9	21 17.4	− 7 11.3	+1.0369	0.5529	0.2342	+90	+20
19 Piscium	4.9	0.68	6.3	2 56.0	6 1 50.6	− 2 47.1	+0.7047	0.5524	0.2324	+90	− 1
36 Piscium	6.3	0.83	7.6	7 41.2	15 35.9	+10 30.4	−0.9578	0.5519	0.2245	−15	−82
d Piscium	5.3	0.88	7.6	7 38.2	17 26.0	−11 43.3	−0.4967	0.5519	0.2232	+12	−68
45 Piscium	6.9	+0.91	+7.3	+ 7 8.4	19 45.4	− 9 28.6	+0.5241	0.5520	+0.2214	+72	− 9
75 Piscium	6.0	1.18	8.6	12 25.2	7 14 17.6	+ 8 25.8	−0.9202	0.5541	0.2032	−13	−78
η Piscium	3.7	1.35	8.9	12 50.0	8 1 30.1	− 4 44.6	−1.1985	0.5560	0.1892	−36	−75
101 Piscium	6.3	1.37	8.5	14 9.2	3 25.9	− 2 52.7	−0.1360	0.5564	0.1865	+31	−41
104 Piscium	7.5	1.39	8.3	13 46.8	4 59.5	− 1 22.4	+0.5368	0.5567	0.1844	+74	− 4
27 Arietis	6.3	+1.73	+7.9	+17 15.8	9 3 51.8	− 3 17.9	+0.7502	0.5618	+0.1502	+90	+12
B. A. C. 782	7.0	1.75	8.2	18 26.5	5 2.0	− 2 10.1	−0.3039	0.5624	0.1457	+22	−46
μ Arietis	6.0	1.83	8.3	19 35.3	8 51.6	+ 1 31.5	−0.9551	0.5633	0.1388	−17	−70
40 Arietis	6.3	1.84	7.5	17 52.2	11 34.5	+ 4 8.6	+1.2081	0.5639	0.1337	+90	+48
47 Arietis	6.0	1.93	7.8	20 16.2	15 41.9	+ 8 7.2	−0.7651	0.5648	0.1259	− 4	−70
δ Arietis	4.0	+2.00	+7.0	+19 27.0	21 35.8	−10 11.5	+0.9063	0.5661	+0.1142	+90	+25
ζ Arietis	4.8	2.04	7.2	20 40.6	23 0.4	− 8 49.9	−0.3246	0.5664	0.1114	+21	−44
τ^1 Arietis	5.0	2.07	6.9	20 47.3	10 1 44.4	− 6 11.8	−0.1460	0.5670	0.1059	+31	−33
τ^2 Arietis	5.3	2.08	6.8	20 23.2	2 24.6	− 5 32.9	+0.3469	0.5672	0.1045	+61	− 6
65 Arietis	6.0	2.08	6.7	20 21.1	3 8.0	− 4 51.1	+0.3534	0.5672	0.1030	+61	− 6
B. A. C. 1055	6.8	+2.10	+7.1	+21 41.4	3 10.4	− 4 48.8	−0.9438	0.5672	+0.1029	−17	−68
B. A. C. 1143	6.0	2.20	5.8	20 36.9	11 46.0	+ 3 28.4	+0.9955	0.5672	0.0849	+90	+34
B. A. C. 1189	6.0	2.25	5.8	21 56.6	14 5.4	+ 5 42.8	−0.2138	0.5688	0.0799	+27	−34
32 Tauri	6.0	2.29	5.5	22 11.5	17 4.3	+ 8 35.2	−0.2482	0.5692	0.0734	+25	−35
33 Tauri	6.3	2.30	5.7	22 53.2	17 9.0	+ 8 39.8	−0.9772	0.5692	0.0732	−20	−67
B. A. C. 1238	6.3	+2.32	+5.5	+22 55.3	18 48.9	+10 16.1	−0.8956	0.5693	+0.0696	−14	−67
A^1 Tauri	4.6	2.32	5.0	21 48.6	20 26.3	+11 50.0	+0.3903	0.5695	0.0661	+64	− 1
A^2 Tauri	6.3	2.32	5.0	21 44.4	20 42.7	−11 54 3	+0.4816	0.5695	0.0655	+71	+ 5
56 Tauri	6.0	2.39	4.1	21 32.0	11 2 51.0	− 5 59.2	+1.0633	0.5698	0.0519	+90	+41
χ^1 Tauri	4.7	2.43	3.9	22 4.0	5 18.5	− 3 37.0	+0.6193	0.5699	0.0464	+85	+14
χ^2 Tauri	6.3	+2.43	+3.9	+21 58.3	5 19.9	− 3 35.7	+0.7201	0.5699	+0.0463	+90	+20
υ^1 Tauri	4.7	2.44	4.0	22 35.3	5 42.1	− 3 14.3	+0.0834	0.5699	0.0455	+44	−14
υ^2 Tauri	6.0	2.45	4.0	22 46.3	6 7.6	− 2 49.7	−0.0930	0.5699	0.0445	+33	−24
τ Tauri	4.5	2.51	3.0	22 46.0	12 32.9	+ 3 21.8	+0.1533	0.5697	0.0301	+48	− 9
95 Tauri	6.3	2.54	3.2	23 54.0	12 57.0	+ 3 44.9	−1.0425	0.5697	0.0292	−26	−66
B. A. C. 1463	6.3	+2.54	+3.0	+23 26.7	14 1.4	+ 4 47.0	−0.5285	0.5697	+0.0268	+49	−49
99 Tauri	6.0	2.60	2.3	23 47.6	19 13.6	+ 9 48.1	−0.7916	0.5693	0.0150	− 7	−66
103 Tauri	6.0	2.64	1.7	24 8.0	23 39.8	− 9 55.3	−1.1124	0.5687	+0.0050	−33	−66
108 Tauri	6.3	2.63	+0.9	22 10.3	12 2 52.8	− 6 49.2	+0.9916	0.5683	−0.0022	+90	+42
121 Tauri	6.0	2.73	−0.1	23 58.4	11 31.6	+ 1 31.1	−1.0425	0.5665	0.0214	−26	−66
B. A. C. 1801	6.0	+2.74	−0.8	+23 9.4	14 58.9	+ 4 51.0	−0.2543	0.5656	−0.0292	+24	−32

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
NEPTUNE				+22 3.6	12 15 16.8	+ 5 8.1	+0.9171	0.5666	−0.0296	+90	+34
140 Tauri	7.0	+2.78	− 2.0	22 53.6	22 31.2	−11 52.6	−0.2511	0.5634	0.0452	+24	−33
141 Tauri	6.7	2.78	2.1	22 23.8	23 4.2	−11 20.6	+0.2586	0.5632	0.0464	+55	− 5
1 Geminorum	5.0	2.80	2.1	23 16.1	13 0 7.5	−10 19.6	−0.7318	0.5629	0.0487	− 3	−67
3 Geminorum	6.3	2.81	2.5	23 7.7	2 36.8	− 7 54.6	−0.7085	0.5620	0.0539	− 2	−66
4 Geminorum	7.4	+2.81	− 2.6	+23 0.8	2 57.4	− 7 35.6	−0.6023	0.5618	−0.0546	+ 5	−57
6 Geminorum	6.7	2.81	2.7	22 55.8	3 46.0	− 6 48.8	−0.5583	0.5616	0.0563	+ 7	−55
η Geminorum	3.5	2.81	2.9	22 32.1	4 54.9	− 5 42.2	−0.1973	0.5611	0.0587	+28	−31
μ Geminorum	3.2	2.82	3.5	22 33.8	8 31.0	− 2 13.6	−0.4537	0.5598	0.0661	+13	−48
14 Geminorum	7.2	2.81	3.8	21 42.0	9 46.1	− 1 1.1	+0.3972	0.5593	0.0686	+65	0
d Geminorum	6.0	+2.84	− 5.4	+21 52.6	21 27.5	+10 16.3	−0.7341	0.5542	−0.0915	− 4	−67
ζ Geminorum	4.0	2.83	6.3	20 42.9	14 3 15.1	− 8 7.8	−0.0331	0.5517	0.1022	+37	−26
56 Geminorum	5.7	2.84	7.4	20 37.8	11 33.5	− 0 5.8	−0.8520	0.5473	0.1168	−10	−69
61 Geminorum	6.0	2.83	7.7	20 27.3	13 54.2	+ 2 10.3	−0.9399	0.5461	0.1207	−17	−70
f Geminorum	6.0	2.79	8.5	17 54.0	19 53.7	+ 7 58.1	+1.0980	0.5429	0.1304	+90	+37
g Geminorum	5.3	+2.80	− 8.8	+18 45.1	23 3.8	+11 2.1	−0.2537	0.5412	−0.1354	+25	−42
B. A. C. 2658	7.2	2.79	9.7	18 31.0	15 6 6.1	− 6 9.0	−0.9873	0.5374	0.1457	−19	−71
3 Cancri	6.0	2.77	9.7	17 34.8	6 10.1	− 6 5.2	+0.0302	0.5374	0.1457	+41	−28
5 Cancri	6.3	2.76	9.7	16 43.7	6 32.0	− 5 43.9	+0.9104	0.5372	0.1463	+90	+21
29 Cancri	6.0	2.70	11.0	14 32.3	19 57.2	+ 7 16.3	+1.2343	0.5300	0.1638	+90	+46
a^2 Cancri	4.0	+2.63	−12.1	+12 14.5	16 11 8.5	− 2 0.0	+1.1515	0.5224	−0.1803	+90	+35
ω Leonis	5.9	2.53	12.8	9 29.3	17 2 48.4	−10 47.5	+1.2629	0.5154	0.1937	+90	+44
h Leonis	5.7	2.52	13.0	10 9.2	4 39.3	− 8 59.8	+0.1687	0.5147	0.1950	+48	−27
o Leonis	3.8	2.49	13.3	10 20.6	9 32.7	− 4 14.8	−1.0042	0.5128	0.1983	−18	−80
11 Sextantis	6.0	2.43	13.5	8 47.3	18 39.6	+ 4 36.6	−1.1135	0.5097	0.2036	−26	−81
π Leonis	5.0	+2.42	−13.5	+ 8 31.2	19 47.6	+ 5 42.7	−1.0483	0.5093	−0.2041	−21	−81
14 Sextantis	6.6	2.39	13.2	6 5.7	23 22.7	+ 9 11.6	+0.9059	0.5082	0.2059	+90	+13
16 Sextantis	6.9	2.39	13.4	6 39.4	18 0 42.3	+10 29.0	+0.0093	0.5079	0.2064	+39	−37
34 Sextantis	6.7	2.26	13.4	4 6.1	18 59.4	+ 4 15.6	−0.9885	0.5039	0.2122	−17	−86
36 Sextantis	6.6	2.25	13.1	3 0.6	20 23.3	+ 5 37.3	−0.0734	0.5038	0.2125	+35	−43
55 Leonis	6.2	+2.21	−12.8	+ 1 16.0	19 2 12.3	+11 16.7	+0.6248	0.5031	−0.2133	+81	− 5
57 Leonis	6.9	2.21	12.7	0 57.8	2 28.4	+11 32.4	+0.9048	0.5031	0.2133	+90	+11
p^2 Leonis	5.4	2.18	12.7	+ 0 32.0	6 34.8	− 8 28.0	+0.5041	0.5028	0.2136	+70	−12
p^4 Leonis	6.9	2.16	12.3	− 0 47.3	9 41.5	− 5 26.4	+1.3142	0.5026	0.2137	+89	+46
p^5 Leonis	5.7	2.14	12.7	+ 0 28.3	12 11.1	− 3 0.9	−0.6238	0.5025	0.2137	+ 5	−81
e Leonis	5.3	+2.07	−11.9	− 2 27.3	21 19.7	+ 5 52.6	+0.6715	0.5028	−0.2130	+85	− 3
B. A. C. 4006	6.1	1.99	11.1	4 46.8	20 8 43.4	− 7 2.6	+0.8328	0.5039	0.2108	+85	+ 6
q Virginis	5.7	1.81	9.4	8 54.2	21 7 52.4	− 8 32.5	+0.6054	0.5097	0.2011	+75	− 6
i Virginis	5.7	1.59	7.3	12 11.4	22 11 28.9	− 5 44.2	−1.0738	0.5221	0.1803	−28	−90
75 Virginis	6.0	1.58	6.2	14 51.0	14 34.2	− 2 44.5	+1.2781	0.5238	0.1775	+75	+46
83 Virginis	6.0	+1.52	− 5.7	−15 40.7	20 23.4	+ 2 54.1	+1.1622	0.5273	−0.1712	+74	+33
85 Virginis	6.5	1.53	5.8	15 16.0	20 56.3	+ 3 25.9	+0.6208	0.5276	0.1706	+70	− 5
B. A. C. 4700	5.6	1.41	5.0	15 49.9	23 9 18.7	− 8 34.9	−0.7887	0.5356	0.1558	−12	−90
B. A. C. 4722	5.8	1.40	4.2	17 44.1	11 28.8	− 6 28.9	+0.9345	0.5368	0.1530	+72	+15
ι^1 Libræ	5.0	1.13	2.3	19 24.8	24 13 47.6	− 5 3.4	−0.7886	0.5642	0.1139	−18	−90
ι^2 Libræ	6.5	+1.13	− 2.3	−19 16.3	14 17.3	− 4 34.8	−0.9981	0.5644	−0.1127	−31	−90
δ Scorpii	2.6	0.93	0.2	22 20.2	25 10 43.2	− 8 51.2	+0.3880	0.5715	0.0709	+44	−17
B. A. C. 5395	7.0	0.86	− 0.3	21 8.7	16 22.6	− 3 24.3	−1.2260	0.5753	0.0586	−58	−90
ρ Ophiuchi(*S.star*)	5.0	0.82	+ 0.5	23 13.0	21 18.2	+ 1 20.3	+0.6760	0.5785	0.0475	+63	0
15 Ophiuchi	7.3	0.73	0.9	22 59.8	26 5 21.5	+ 9 5.4	+0.1391	0.5833	0.0286	+25	−31
URANUS				−22 6.1	5 30.1	+ 9 13.6	−0.7935	0.5817	−0.0279	−26	−90
22 Ophiuchi	6.7	+0.69	+ 1.0	23 20.9	9 18.2	−11 7.0	+0.4071	0.5855	0.0191	+40	−16
24 Ophiuchi	5.9	0.68	1.1	22 59.5	10 6.1	−10 20.9	+0.0237	0.5858	−0.0171	+17	−38
52 Ophiuchi	6.5	0.52	1.4	21 58.6	27 1 32.5	+ 4 29.6	−0.9805	0.5927	+0.0215	−39	−90
B. A. C. 5954	6.8	0.51	1.4	21 51.2	2 54.6	+ 5 48.5	−1.0732	0.5933	0.0251	−46	−90
Piazzi 330	5.3	+0.42	+ 2.0	−23 8.4	12 41.7	− 8 47.7	+0.6051	0.5960	+0.0502	+57	− 4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
Piazzi 334	5.3	+0.42	+1.9	−22 50.3	27 12 49.1	− 8 40.6	+0.3062	0.5960	+0.0505	+37	−21
SATURN				22 27.2	14 53.7	− 6 41.0	+0.0263	0.5922	0.0558	+21	−37
μ Sagittarii	4.1	0.38	1.7	21 5.1	16 42.5	− 4 56.5	−1.2536	0.5968	0.0605	−62	−90
14 Sagittarii	6.0	0.39	1.8	21 44.4	16 53.6	− 4 45.8	−0.5793	0.5968	0.0610	−11	−81
B. A. C. 6336	6.2	0.32	2.0	21 28.8	28 2 9.2	+ 4 7.7	−0.1655	0.5978	0.0845	+12	−48
B. A. C. 6347	6.0	+0.31	+1.9	−21 8.0	2 32.9	+ 4 30.4	−0.4800	0.5978	+0.0855	− 3	−71
28 Sagittarii	5.6	0.30	2.2	22 29.8	5 26.1	+ 7 16.7	+1.1452	0.5978	0.0926	+68	+35
B. A. C. 6386	7.3	0.29	1.9	20 23.0	6 4.2	+ 7 53.3	−0.9167	0.5978	0.0940	−28	−90
29 Sagittarii	5.5	0.28	1.9	20 26.3	6 46.3	+ 8 53.7	−0.7943	0.5979	0.0960	−20	−90
30 Sagittarii	6.6	0.29	2.2	22 16.6	7 12.0	+ 8 58.4	+1.0904	0.5978	0.0970	+68	+29
31 Sagittarii	7.0	+0.28	+2.2	−22 2.3	7 42.6	+ 9 27.8	+0.9013	0.5978	+0.0983	+68	+14
33 Sagittarii	6.0	0.27	2.1	21 28.9	8 26.9	+10 10.3	+0.4162	0.5978	0.1001	+48	−16
ξ^1 Sagittarii	5.7	0.26	1.9	20 47.2	9 46.1	+11 26.3	−0.1454	0.5978	0.1033	+16	−47
ξ^2 Sagittarii	3.5	0.26	2.1	21 14.3	9 54.7	+11 34.5	+0.3207	0.5978	0.1037	+42	−21
B. A. C. 6536	5.8	0.24	1.9	19 26.8	14 4.5	− 8 25.6	−1.0170	0.5975	0.1137	−34	−90
π Sagittarii	3.1	+0.24	+2.2	−21 10.9	14 37.7	− 8 3.7	+0.7798	0.5974	+0.1151	+69	+ 6
d Sagittarii	5.0	0.22	1.9	19 7.8	17 45.0	− 4 53.9	−0.8965	0.5971	0.1224	−24	−90
B. A. C. 6658	7.3	0.20	1.9	18 33.6	21 52.1	− 0 56.6	−0.9384	0.5964	0.1319	−26	−90
B. A. C. 6707	6.4	0.18	2.1	19 4.4	29 1 8.9	+ 2 12.5	+0.0164	0.5958	0.1393	+28	−38
B. A. C. 6710	5.8	0.18	2.0	18 27.2	1 24.2	+ 2 27.1	−0.5634	0.5958	0.1398	− 2	−78
57 Sagittarii	6.1	+0.16	+2.1	−19 17.9	7 22.9	+ 8 11.7	+1.1493	0.5944	+0.1527	+71	+33
				NEW	*MOON.*						
FEBRUARY.											
κ Aquarii	5.8	+0.25	+2.9	− 4 44.6	1 3 54.2	+ 2 8.0	+0.9455	0.5703	+0.2384	+85	+14
Lalande 44337	6.3	0.26	3.0	4 4.3	5 12.5	+ 3 23.6	+0.5979	0.5700	0.2388	+77	−16
3 Piscium	6.4	0.31	3.6	− 0 21.0	13 48.0	+11 40.6	−1.0056	0.5677	0.2402	−18	−90
κ Piscium	4.7	0.40	3.8	+ 0 42.5	2 1 15.1	− 1 16.8	+0.6979	0.5653	0.2391	+89	− 1
9 Piscium	6.6	+0.40	+3.8	+ 0 34.4	1 23.5	− 1 8.7	+0.8648	0.5653	+0.2391	+90	+ 9
16 Piscium	5.8	0.41	4.0	1 32.9	5 23.9	+ 2 43.2	+0.8580	0.5646	0.2379	+90	+ 8
19 Piscium	4.9	0.45	4.3	2 56.0	9 46.9	+ 6 56.9	+0.5265	0.5640	0.2361	+72	−10
36 Piscium	6.3	0.58	5.4	7 41.2	23 2.1	− 4 15.8	−1.1207	0.5629	0.2280	−27	−82
d Piscium	5.3	0.60	5.4	7 38.2	3 0 48.1	− 2 33.6	−0.6701	0.5628	0.2266	+ 3	−82
45 Piscium	6.9	+0.62	+5.2	+ 7 8.4	3 2.5	− 0 23.8	+0.3312	0.5628	+0.2248	+58	−20
75 Piscium	6.0	0.84	6.4	12 25.3	20 58.2	− 7 6.0	−1.0862	0.5625	0.2060	−25	−78
101 Piscium	6.3	1.01	6.6	14 9.1	4 9 44.2	+ 5 13.0	−0.3363	0.5630	0.1888	+20	−52
104 Piscium	7.5	1.03	6.4	13 46.8	11 15.4	+ 6 40.9	+0.3273	0.5638	0.1865	+58	−16
27 Arietis	6.3	1.36	6.4	17 15.8	5 9 38.7	+ 4 16.5	+0.5394	0.5641	0.1493	+75	0
B. A. C. 782	7.0	+1.39	+6.8	+18 26.5	10 47.7	+ 5 23.1	−0.5042	0.5661	+0.1470	+11	−59
μ Arietis	6.0	1.45	6.9	19 35.2	14 29.4	+ 8 56.7	−1.1591	0.5667	0.1400	−35	−70
40 Arietis	6.3	1.48	6.1	17 52.1	17 14.5	+11 36.0	+0.9963	0.5671	0.1348	+90	+29
47 Arietis	6.0	1.56	6.6	20 16.2	21 18.7	− 8 28.6	−0.9594	0.5674	0.1268	−18	−70
δ Arietis	4.0	1.64	5.8	19 21.0	6 3 8.8	− 2 51.1	+0.7017	0.5678	0.1151	+90	+12
ζ Arietis	4.8	+1.67	+6.1	+20 40.5	4 32.6	− 1 30.4	−0.5200	0.5683	+0.1122	+10	−56
τ^1 Arietis	5.0	1.72	5.9	20 47.3	7 15.2	+ 1 6.4	−0.3414	0.5684	0.1068	+20	−44
τ^2 Arietis	5.3	1.72	5.7	20 23.3	7 55.1	+ 1 44.9	+0.1488	0.5686	0.1053	+48	−17
65 Arietis	6.0	1.73	5.6	20 27.1	8 38.1	+ 2 26.3	+0.1594	0.5687	0.1037	+48	−16
B. A. C. 1055	6.8	1.75	6.1	21 41.4	8 40.6	+ 2 20.7	−1.1336	0.5687	0.1037	−33	−68
B. A. C. 1143	6.0	+1.86	+4.9	+20 36.9	17 13.3	+10 43.0	+0.8001	0.5687	+0.0856	+90	+21
B. A. C. 1189	6.0	1.91	4.9	21 56.5	19 32.1	−11 3.2	−0.4021	0.5689	0.0806	+16	−46
32 Tauri	6.0	1.95	4.9	22 11.5	22 30.5	− 8 11.3	−0.4344	0.5689	0.0741	+14	−47
33 Tauri	6.3	1.97	5.1	22 53.2	22 35.1	− 8 6.8	−1.1607	0.5690	0.0739	−37	−67
B. A. C. 1238	6.3	1.99	5.0	22 55.3	7 0 14.9	− 6 30.7	−1.0784	0.5699	0.0703	−29	−67
A^1 Tauri	4.6	+2.00	+4.4	+21 48.6	1 52.2	− 4 56.9	+0.2041	0.5689	+0.0667	+51	− 9

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° '	d h m	h m				°	°
A^2 Tauri	6.3	+2.00	+ 4.4	+21 44.4	7 2 8.5	− 4 41.1	+0.2951	0.5687	+0.0661	+57	− 5
51 Tauri	6.0	2.07	3.6	21 20.2	7 45.3	+ 0 43.5	+1.0612	0.5685	0.0538	+90	+43
56 Tauri	6.0	2.08	3.6	21 32.0	8 16.8	+ 1 13.9	+0.8810	0.5685	0.0526	+90	+29
χ^1 Tauri	4.7	2.13	3.5	22 4.0	10 44.5	+ 3 36.3	+0.4400	0.5684	0.0471	+68	+ 5
χ^2 Tauri	6.3	2.12	3.4	21 58.3	10 45.8	+ 3 37.5	+0.5404	0.5683	0.0471	+77	+10
υ^1 Tauri	4.7	+2.14	+ 3.6	+22 35.3	11 8.2	+ 3 59.1	−0.0944	0.5683	+0.0463	+33	−24
υ^2 Tauri	6.0	2.15	3.6	22 46.3	11 33.7	+ 4 23.7	−0.2702	0.5683	0.0453	+23	−34
τ Tauri	4.5	2.24	2.8	22 46.0	18 0.1	+10 36.3	−0.0185	0.5676	0.0310	+38	−18
B. A. C. 1463	6.3	2.27	2.9	23 26.7	19 29.0	−11 58.1	−0.6982	0.5674	0.0277	− 2	−64
99 Tauri	6.0	2.34	2.3	23 47.6	8 0 42.6	− 6 55.6	−0.9564	0.5665	+0.0160	−19	−66
108 Tauri	6.3	+2.41	+ 0.7	+22 10.3	8 24.8	+ 0 30.2	+0.8352	0.5650	−0.0010	+90	+32
n Tauri	5.7	2.43	+ 0.5	21 59.6	10 4.8	+ 2 6.6	+1.0212	0.5647	0.0046	+90	+44
o Tauri	6.0	2.47	− 0.1	21 51.1	13 44.4	+ 5 38.5	+1.1433	0.5638	0.0126	+90	+53
121 Tauri	6.0	2.56	+ 0.1	23 58.4	17 7.7	+ 8 54.6	−1.1909	0.5629	0.0200	−42	−66
NEPTUNE				22 3.4	19 54.9	+11 35.9	+0.8067	0.5627	0.0260	+90	+27
B. A. C. 1801	6.0	+2.56	− 0.6	+23 9.5	20 36.9	−11 43.6	−0.3976	0.5619	−0.0275	+16	−40
140 Tauri	7.0	2.64	1.8	22 53.6	9 4 13.5	− 4 22.9	−0.3849	0.5594	0.0435	+17	−41
141 Tauri	6.7	2.63	2.0	22 23.8	4 46.8	− 3 50.8	+0.1267	0.5594	0.0447	+46	−12
1 Geminorum	5.0	2.66	1.9	23 16.1	5 50.9	− 2 48.8	−0.8634	0.5589	0.0469	−12	−67
3 Geminorum	6.3	2.68	2.3	23 7.7	8 21.7	− 0 23.3	−0.8380	0.5580	0.0521	−10	−67
4 Geminorum	7.4	+2.68	− 2.3	+23 0.8	8 42.5	− 0 3.2	−0.7314	0.5579	−0.0528	− 4	−66
6 Geminorum	6.7	2.69	2.4	22 55.8	9 31.6	+ 0 44.2	−0.6858	0.5576	0.0541	− 1	−65
η Geminorum	3.5	2.69	2.8	22 32.1	10 41.3	+ 1 51.6	−0.3225	0.5571	0.0568	+21	−38
μ Geminorum	3.2	2.72	3.3	22 33.8	14 19.6	+ 5 22.4	−0.5744	0.5558	0.0641	+ 6	−56
14 Geminorum	7.2	2.72	3.7	21 42.0	15 35.6	+ 6 35.8	+0.2806	0.5553	0.0668	+56	− 6
15 Geminor.(2^d *star*)	7.0	+2.71	− 4.0	+20 51.0	16 32.9	+ 7 31.1	+1.1377	0.5549	−0.0685	+90	+47
d Geminorum	6.0	2.81	5.3	21 52.6	10 3 24.7	− 5 59.0	−0.3867	0.5503	0.0892	−10	−68
ζ Geminorum	4.0	2.83	6.4	20 42.9	9 16.1	− 0 19.3	−0.1241	0.5477	0.0998	+32	−31
56 Geminorum	5.7	2.87	7.5	20 37.8	17 39.6	+ 7 47.8	−0.9318	0.5438	0.1137	−16	−69
61 Geminorum	6.0	2.88	7.8	20 27.3	20 1.8	+10 5.4	−1.0160	0.5427	0.1182	−22	−70
f Geminorum	6.0	+2.87	− 9.1	+17 54.0	11 2 4.8	− 8 3.4	+1.0396	0.5398	−0.1278	+90	+33
g Geminorum	5.3	2.90	9.3	18 45.1	5 16.6	− 4 57.6	−0.3111	0.5383	0.1327	+21	−46
B. A. C. 2658	7.2	2.92	10.2	18 31.0	12 22.6	+ 1 54.9	−1.0340	0.5350	0.1431	−23	−71
3 Cancri	6.0	2.90	10.4	17 34.8	12 26.7	+ 1 58.8	−0.0130	0.5349	0.1432	+38	−30
5 Cancri	6.3	2.89	10.5	16 43.7	12 48.7	+ 2 20.2	+0.8711	0.5347	0.1437	+90	+19
ζ^1 Cancri	4.8	+2.92	−10.9	+17 56.7	18 4.1	− 8 33.6	−1.2436	0.5322	−0.1508	−44	−72
29 Cancri	6.0	2.89	12.3	14 32.3	12 2 19.8	+ 7 25.8	+1.2218	0.5284	0.1613	+90	+45
a^2 Cancri	4.0	2.88	13.4	12 14.5	17 35.7	+ 6 14.8	+1.1692	0.5217	0.1781	+90	+37
ω Leonis	5.9	2.86	15.2	9 29.3	13 9 18.3	− 2 30.2	+1.3156	0.5158	0.1917	+90	+52
k Leonis	5.7	2.86	15.3	10 9.2	11 9.3	− 0 42.4	+0.2202	0.5151	0.1931	+51	−24
o Leonis	3.8	+2.85	−15.6	+10 20.6	16 2.7	+ 4 2.6	−0.9442	0.5134	−0.1965	−15	−80
11 Sextantis	6.0	2.83	16.1	8 47.2	14 1 9.7	−11 5.9	−1.0348	0.5108	0.2020	−20	−81
π Leonis	5.0	2.83	16.2	8 31.2	2 17.5	−10 0.0	−0.9666	0.5106	0.2026	−16	−81
14 Sextantis	6.6	2.81	16.3	6 5.7	5 52.4	− 6 31.2	+0.9983	0.5097	0.2044	+90	+19
16 Sextantis	6.9	2.81	16.4	6 39.4	7 11.9	− 5 13.9	+0.1006	0.5094	0.2050	+44	−32
34 Sextantis	6.7	+2.75	−16.9	+ 4 6.0	15 1 26.6	−11 29.7	−0.8696	0.5061	−0.2111	− 9	−86
36 Sextantis	6.6	2.75	16.9	3 30.6	2 50.2	−10 8.3	+0.0606	0.5059	0.2114	+43	−35
55 Leonis	6.2	2.73	16.8	1 15.9	8 38.2	− 4 30.0	+0.7711	0.5053	0.2123	+90	+ 3
57 Leonis	6.9	2.73	16.8	0 57.7	8 54.2	− 4 14.3	+1.0523	0.5053	0.2123	+90	+21
p^2 Leonis	5.4	2.71	16.8	0 32.0	12 59.9	− 0 15.5	+0.6585	0.5049	0.2126	+84	− 3
p^5 Leonis	5.7	+2.69	−16.9	+ 0 28.2	18 35.2	+ 5 10.7	−0.4605	0.5049	−0.2129	+14	−67
e Leonis	5.3	2.66	16.5	− 2 27.4	16 3 42.2	− 9 57.5	+0.8539	0.5051	0.2123	+88	+ 8
B. A. C. 4006	6.1	2.62	16.0	4 46.9	15 4.5	+ 1 6.0	+1.0346	0.5060	0.2100	+85	+21
q Virginis	5.7	2.52	14.5	8 54.3	17 14 13.8	− 0 23.6	+0.8410	0.5107	0.2002	+81	+ 8
χ Virginis	5.2	2.50	14.7	7 27.0	17 9.4	+ 2 27.0	−1.1322	0.5116	0.1984	−60	−90
ψ Virginis	5.2	+2.47	−14.0	− 9 0.0	18 1 9.9	+10 13.7	−1.2046	0.5142	−0.1931	−38	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0. Δα	Red'ns from 1900.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
g Virginis	5.9	+2.43	−13.4	−10 12.6	**18** 8 15.9	− 6 52.6	−1.2198	0.5168	−0.1876	−40	−90
i Virginis	5.7	2.38	12.3	12 11.5	18 0.1	+ 2 34.5	−0.8209	0.5210	0.1789	−11	−90
85 Virginis	6.5	2.34	10.8	15 16.1	**19** 3 33.7	+11 50.9	+0.8947	0.5271	0.1696	+75	+13
B. A. C. 4700	5.6	2.25	9.7	15 49.9	16 7.3	+ 0 1.3	−0.5251	0.5322	0.1542	+ 3	−73
B. A. C. 4722	5.8	2.25	9.0	17 44.2	18 19.6	+ 2 9.5	+1.1250	0.5335	0.1514	+72	+40
10 Libræ	6.5	+2.11	− 7.5	−17 56.7	**20** 11 46.5	− 4 57.1	−0.9866	0.5438	−0.1261	−29	−90
ι¹ Libræ	5.0	2.04	6.1	19 24.9	21 12.9	+ 4 10.6	−0.5154	0.5496	0.1106	− 2	−73
ι² Libræ	6.5	2.03	6.1	19 16.3	21 43.4	+ 4 40.1	−0.7247	0.5499	0.1097	−14	−90
δ Scorpii	2.6	1.84	3.1	22 20.3	**21** 18 44.7	+ 0 58.0	+0.6560	0.5627	0.0701	+63	− 1
B. A. C. 5395	7.0	1.77	3.0	21 8.7	**22** 0 35.0	+ 6 35.9	−0.9849	0.5661	0.0580	−36	−90
ρ Ophiuchi(~~S.star~~)	5.0	+1.74	− 1.8	−23 13.0	5 40.4	+11 30.3	+0.9404	0.5689	−0.0472	+67	+18
15 Ophiuchi	7.3	1.64	1.1	22 59.9	14 0.1	− 4 28.1	+0.3885	0.5733	0.0288	+40	−17
URANUS				22 13.1	15 40.8	− 2 51.1	−0.4759	0.5746	0.0249	− 9	−71
22 Ophiuchi	6.7	1.59	0.6	23 20.9	18 5.0	− 0 32.2	+0.6565	0.5754	0.0195	+60	− 1
24 Ophiuchi	5.9	1.58	− 0.6	22 59.5	18 54.5	+ 0 15.4	+0.2667	0.5756	−0.0176	+31	−23
52 Ophiuchi	6.5	+1.37	+ 0.4	−21 58.6	**23** 10 53.4	− 8 21.6	−0.7709	0.5821	+0.0200	−26	−90
B. A. C. 5954	5.8	1.35	0.5	21 51.2	12 18.3	− 6 59.9	−0.8664	0.5824	0.0234	−32	−90
58 Ophiuchi	5.4	1.32	0.6	21 38.1	14 13.7	− 5 8.9	−1.0429	0.5832	0.0281	−44	−90
Piazzi 17ʰ 330	5.3	1.24	1.7	23 8.4	22 25.6	+ 2 44.2	+0.8218	0.5855	0.0479	+67	+10
Piazzi 17ʰ 334	5.3	1.24	1.6	22 50.3	22 33.3	+ 2 41.6	+0.5184	0.5855	0.0482	+51	− 9
μ Sagittarii	4.1	+1.17	+ 1.3	−21 5.1	**24** 2 34.5	+ 6 43.6	−1.0691	0.5864	+0.0579	−43	−90
14 Sagittarii	6.0	1.18	1.5	21 44.4	2 45.9	+ 6 54.6	−0.3867	0.5865	0.0584	− 1	−64
SATURN				22 25.0	4 59.2	+ 9 2.7	+0.4426	0.5838	0.0636	+46	−12
B. A. C. 6336	6.2	1.06	2.1	21 28.8	12 19.4	− 7 54.0	+0.0183	0.5881	0.0814	+23	−38
B. A. C. 6347	6.0	1.05	2.0	21 8.0	12 43.7	− 7 30.6	−0.3012	0.5881	0.0824	+ 6	−57
B. A. C. 6386	7.3	+1.00	+ 2.0	−20 23.0	16 21.6	− 4 1.1	−0.7523	0.5884	+0.0910	−18	−90
29 Sagittarii	5.5	1.00	2.1	20 26.3	17 4.9	− 3 19.5	−0.6283	0.5885	0.0927	−11	−86
31 Sagittarii	7.0	1.00	2.6	22 2.3	18 2.8	− 2 23.8	+1.0881	0.5886	0.0949	+68	+29
33 Sagittarii	6.0	0.99	2.5	21 28.9	16 48.6	− 1 39.8	+0.5958	0.5886	0.0968	+60	− 5
ξ¹ Sagittarii	5.7	0.96	2.2	20 47.2	20 10.0	− 0 21.6	+0.0229	0.5887	0.0999	+25	−37
ξ² Sagittarii	3.5	+0.97	+ 2.5	−21 14.2	20 18.9	− 0 13.1	+0.4964	0.5887	+0.1002	+53	−10
Lalande 35497	6.4	0.93	2.1	19 23.4	22 29.7	+ 1 52.7	−1.1498	0.5888	0.1053	−46	−90
B. A. C. 6536	5.8	0.91	2.2	19 26.8	**25** 0 35.6	+ 3 53.7	−0.8652	0.5888	0.1101	−23	−90
π Sagittarii	3.1	0.91	2.8	21 10.9	1 9.8	+ 4 26.6	+0.9512	0.5888	0.1114	+69	+18
d Sagittarii	5.0	0.86	2.4	19 7.8	4 22.1	+ 7 31.4	−0.7502	0.5888	0.1187	−15	−90
B. A. C. 6658	7.3	+0.82	+ 2.4	−18 33.6	8 45.4	+11 34.9	−0.8007	0.5887	+0.1281	−17	−90
B. A. C. 6707	6.4	0.78	2.7	19 4.4	11 56.9	− 9 11.3	+0.1570	0.5885	0.1353	+36	−30
B. A. C. 6710	5.8	0.78	2.6	18 27.2	12 12.6	− 8 56.3	−0.4275	0.5885	0.1360	+ 5	−66
B. A. C. 6992	6.7	0.60	2.6	15 6.0	**26** 5 58.8	+ 8 9.0	−1.0266	0.5863	0.1716	−28	−90
β Capricorni	3.2	0.60	2.6	15 5.8	6 4.5	+ 8 14.5	−1.0133	0.5863	0.1718	−27	−90
B. A. C. 7087	6.3	+0.55	+ 2.6	−14 3.8	11 27.9	−10 34.4	−1.0822	0.5854	+0.1814	−31	−90
τ¹ Capricorni	7.0	0.55	2.8	15 29.6	12 44.5	− 9 20.7	+0.5655	0.5851	0.1836	+66	− 8
τ² Capricorni	5.6	0.55	2.8	15 18.3	13 31.9	− 8 35.2	+0.5248	0.5849	0.1849	+63	−10
8 Aquarii	6.8	0.48	2.7	13 26.4	22 2.1	− 0 24.3	+0.3131	0.5833	0.1984	+45	−21
9 Aquarii	6.8	0.48	2.8	13 55.2	22 32.0	+ 0 4.5	+0.8856	0.5832	0.1992	+76	+11
ν Aquarii	4.7	+0.46	+ 2.6	−11 46.6	**27** 2 2.6	+ 3 27.1	−0.5184	0.5824	+0.2042	+ 7	−72
				NEW	*MOON.*						
MARCH.											
45 Piscium	6.9	+0.45	+ 3.5	+ 7 8.4	**2** 12 57.0	+11 18.7	+0.1508	0.5737	+0.2269	+47	−29
101 Piscium	6.3	0.70	4.1	14 9.1	**3** 18 33.3	− 8 10.0	−0.5614	0.5760	0.1912	+ 8	−67
104 Piscium	7.5	0.71	4.3	13 46.8	20 1.2	− 6 45.3	+0.0887	0.5760	0.1889	+44	−28
27 Arietis	6.3	0.96	4.4	17 15.8	**4** 17 36.4	− 9 58.1	+0.2716	0.5777	0.1511	+55	−14
B. A. C. 782	7.0	+0.98	+ 4.1	+18 26.4	18 43.0	− 8 53.9	−0.7552	0.5778	+0.1489	− 4	−72

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
36 Arietis	6.5	+1.04	+ 4.1	+17 20.5	**4** 23 11.7	− 4 35.2	+1.0073	0.5780	+0.1402	+90	+30
40 Arietis	6.3	1.06	4.2	17 52.1	**5** 0 56.8	− 2 23.9	+0.7148	0.5781	0.1365	+90	+11
ρ^2 Arietis	6.0	1.10	4.1	17 55.7	3 58.5	+ 0 1.0	+1.0604	0.5781	0.1303	+90	+35
47 Arietis	6.0	1.11	3.8	20 16.1	4 53.0	+ 0 53.4	−1.2120	0.5785	0.1285	−42	−70
54 Arietis	6.3	1.17	4.5	18 24.8	9 11.2	+ 5 2.0	+1.2194	0.5781	0.1194	+90	+51
δ Arietis	4.0	+1.19	+ 4.1	+19 21.0	10 31.7	+ 6 19.5	+0.4188	0.5781	+0.1165	+65	− 4
ζ Arietis	4.8	1.21	4.4	20 40.5	11 53.2	+ 7 38.0	−0.7838	0.5781	0.1136	− 6	−69
τ^1 Arietis	5.0	1.25	4.3	20 47.3	14 30.8	+10 9.7	−0.6097	0.5780	0.1080	+ 4	−62
τ^2 Arietis	5.3	1.26	4.1	20 23.1	15 9.6	+10 47.1	−0.1271	0.5780	0.1066	+31	−31
65 Arietis	6.0	1.27	4.0	20 27.1	15 51.4	+11 27.3	−0.1207	0.5780	0.1050	+31	−31
B. A. C. 1143	6.0	+1.39	+ 3.5	+20 36.9	**6** 0 11.8	− 4 30.9	+0.5115	0.5773	+0.0866	+73	+ 5
B. A. C. 1189	6.0	1.43	3.8	21 56.5	2 27.0	− 2 20.7	−0.6737	0.5771	0.0815	0	−65
32 Tauri	6.0	1.47	3.6	22 11.5	5 20.7	+ 0 26.5	−0.7066	0.5768	0.0750	− 2	−67
A^1 Tauri	4.6	1.52	3.2	21 48.6	8 37.4	+ 3 35.9	−0.0771	0.5763	0.0676	+34	−25
A^2 Tauri	6.3	1.50	3.2	21 44.4	8 53.3	+ 3 51.3	+0.0127	0.5762	0.0670	+39	−20
51 Tauri	6.0	+1.60	+ 2.5	+21 20.1	14 22.0	+ 9 7.8	+0.7687	0.5753	+0.0545	+90	+23
53 Tauri	6.0	1.60	2.3	20 54.1	14 49.1	+ 9 33.9	+1.2473	0.5752	0.0535	+90	+62
56 Tauri	6.0	1.61	2.5	21 31.9	14 53.0	+ 9 37.6	+0.5912	0.5752	0.0533	+82	+12
χ^1 Tauri	4.7	1.64	2.5	22 3.9	17 17.4	+11 56.7	+0.1552	0.5748	0.0478	+48	−10
χ^2 Tauri	6.3	1.64	2.5	21 58.3	17 18.8	+11 58.0	+0.2552	0.5747	0.0478	+54	− 6
υ^1 Tauri	4.7	+1.65	+ 2.6	+22 35.3	17 40.7	−11 40.8	−0.3718	0.5746	+0.0469	+17	−40
υ^2 Tauri	6.0	1.66	2.7	22 46.3	18 5.6	−11 16.8	−0.5453	0.5746	0.0460	+ 7	−52
B. A. C. 1373	6.0	1.66	2.2	21 23.8	18 25.0	−10 58.2	+0.9083	0.5745	0.0453	+90	+32
τ Tauri	4.5	1.75	2.0	22 45.9	**7** 0 24.2	− 5 12.1	−0.2961	0.5731	0.0316	+22	−34
B. A. C. 1463	6.3	1.76	2.2	23 26.7	1 51.4	− 3 48.2	−0.9683	0.5731	0.0283	−20	−67
99 Tauri	6.0	+1.84	+ 1.7	+23 47.6	6 59.5	+ 1 8.7	−1.2224	0.5713	+0.0166	−48	−66
105 Tauri	6.0	1.89	0.5	21 34.4	11 21.1	+ 5 20.9	+1.1755	0.5699	0.0068	+90	+57
108 Tauri	6.3	1.94	0.3	22 10.2	14 34.5	+ 8 27.3	+0.5537	0.5689	+0.0004	+78	+15
n Tauri	5.7	1.96	+ 0.1	21 59.6	16 13.1	+10 2.3	+0.7392	0.5683	−0.0040	+90	+26
o Tauri	6.0	2.01	− 0.4	21 51.1	19 49.7	−10 28.8	+0.8626	0.5669	0.0120	+90	+32
NEPTUNE				+22 4.3	**8** 1 38.0	− 4 52.9	+0.5239	0.5646	−0.0247	+75	+11
B. A. C. 1801	6.0	+2.10	0.0	23 9.5	2 37.5	− 3 55.6	−0.6615	0.5643	0.0267	+ 1	−61
140 Tauri	7.0	2.19	− 1.7	22 53.6	10 10.1	+ 3 21.2	−0.6409	0.5610	0.0427	+ 2	−60
141 Tauri	6.7	2.20	1.9	22 23.8	10 43.2	+ 3 53.1	−0.1354	0.5608	0.0438	+31	−26
1 Geminorum	5.0	2.21	1.8	23 16.1	11 46.7	+ 4 54.4	−1.1181	0.5604	0.0460	−34	−67
3 Geminorum	6.3	+2.24	− 2.1	+23 7.7	14 16.5	+ 7 18.9	−1.0906	0.5592	−0.0511	−31	−67
4 Geminorum	7.4	2.24	2.2	23 0.8	14 37.2	+ 7 39.0	−0.9847	0.5590	0.0518	−22	−67
6 Geminorum	6.7	2.25	2.3	22 55.8	15 26.0	+ 8 26.0	−0.9390	0.5586	0.0535	−18	−67
η Geminorum	3.5	2.26	2.6	22 32.1	16 35.2	+ 9 32.9	−0.5769	0.5581	0.0558	+ 6	−56
μ Geminorum	3.2	2.30	2.8	22 33.8	20 12.3	−10 57.5	−0.8244	0.5564	0.0630	−10	−67
14 Geminorum	7.2	+2.31	− 3.5	+21 42.0	21 27.9	− 9 44.5	+0.0272	0.5558	−0.0655	+41	−19
15 Geminor. ~~(2^d star)~~	7.0	2.32	3.9	20 51.0	22 25.0	− 8 49.3	+0.8808	0.5553	0.0674	+90	+28
16 Geminorum	6.8	2.32	4.0	20 33.3	22 29.8	− 8 44.7	+1.1935	0.5553	0.0675	+90	+53
d Geminorum	6.0	2.43	4.9	21 52.7	**9** 9 14.7	+ 1 38.3	−1.0729	0.5499	0.0878	−28	−68
ζ Geminorum	4.0	2.48	5.9	20 42.9	15 5.7	+ 7 17.7	−0.3562	0.5469	0.0982	+19	−44
56 Geminorum	5.7	+2.55	− 7.0	+20 37.8	23 29.6	− 8 34.8	−1.1511	0.5426	−0.1124	−35	−69
61 Geminorum	6.0	2.57	7.3	20 27.3	**10** 1 51.9	− 6 17.1	−1.2322	0.5414	0.1162	−45	−70
f Geminorum	6.0	2.59	8.8	17 58.0	7 55.6	− 0 25.1	+0.8284	0.5383	0.1257	+90	+18
g Geminorum	5.3	2.62	8.9	18 45.1	11 7.9	+ 2 41.1	−0.5151	0.5366	0.1305	+10	−59
B. A. C. 2658	7.2	2.67	9.7	18 31.0	18 15.3	+ 9 35.1	−1.2260	0.5331	0.1407	−42	−71
3 Cancri	6.0	+2.66	−10.0	+17 34.8	18 19.3	+ 9 38.9	−0.2057	0.5331	−0.1408	+27	−40
5 Cancri	6.3	2.66	10.3	16 43.7	18 41.4	+10 0.4	+0.6775	0.5328	0.1413	+90	+ 7
29 Cancri	6.0	2.72	12.2	14 32.3	**11** 8 15.7	− 0 50.3	+1.0539	0.5265	0.1586	+90	+30
α^2 Cancri	4.0	2.78	14.1	12 14.5	23 35.6	− 9 57.9	+1.0326	0.5200	0.1752	+90	+25
ω Leonis	5.9	2.82	15.9	9 29.3	**12** 15 21.7	+ 5 20.6	+1.2118	0.5145	0.1889	+90	+39
h Leonis	5.7	+2.84	−15.9	+10 9.1	17 12.9	+ 7 8.6	+0.1230	0.5140	−0.1903	+45	−29

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
o Leonis	3.8	+2.85	−16.2	+10 20.6	**12** 22 7.4	+11 54.7	−1.0310	0.5126	−0.1937	−21	−80
11 Sextantis	6.0	2.87	17.0	8 47.2	**13** 7 15.6	− 3 12.5	−1.0969	0.5125	0.1993	−26	−81
π Leonis	5.0	2.87	17.1	8 31.2	8 23.6	− 2 6.4	−1.0287	0.5124	0.1999	−20	−81
14 Sextantis	6.6	2.87	17.6	6 5.7	11 58.7	+ 1 22.6	+0.9466	0.5093	0.2017	+90	+15
16 Sextantis	6.9	2.87	17.6	6 39.4	13 18.4	+ 2 40.1	+0.0538	0.5091	0.2024	+41	−34
34 Sextantis	6.7	+2.90	−18.6	+ 4 6.0	**14** 7 33.0	− 3 35.9	−0.8615	0.5067	−0.2088	− 9	−86
36 Sextantis	6.6	2.90	18.7	3 0.5	8 56.6	− 2 14.5	+0.0615	0.5067	0.2092	+42	−35
55 Leonis	6.2	2.90	18.9	1 15.9	14 44.0	+ 3 23.2	+0.7871	0.5064	0.2102	+90	+ 4
57 Leonis	6.9	2.90	19.0	0 57.7	15 0.0	+ 3 38.9	+1.0689	0.5064	0.2102	+90	+23
p^2 Leonis	5.4	2.91	19.2	0 31.9	19 5.1	+ 7 37.1	+0.6858	0.5063	0.2107	+87	− 1
p^5 Leonis	5.7	+2.91	−19.1	+ 0 28.1	**15** 0 39.5	−10 57.6	−0.4185	0.5065	−0.2110	+16	−64
e Leonis	5.3	2.92	19.2	− 2 27.4	9 44.5	− 2 7.7	+0.9183	0.5072	0.2105	+88	+13
B. A. C. 4006	6.1	2.93	19.0	4 47.0	21 3.8	+ 8 52.8	+1.1268	0.5084	0.2085	+85	+27
q Virginis	5.7	2.94	18.2	8 54.3	**16** 20 5.8	+ 7 15.8	+0.9871	0.5137	0.1990	+81	+19
χ Virginis	5.2	2.94	18.1	7 27.0	23 0.4	+10 5.4	−1.1995	0.5146	0.1975	−37	−90
ψ Virginis	5.2	+2.94	−17.5	− 9 0.1	**17** 6 58.4	− 6 10.4	−1.0357	0.5172	−0.1920	−24	−90
g Virginis	5.9	2.93	17.0	10 12.6	14 2.4	+ 0 41.3	−1.0373	0.5198	0.1866	−25	−90
i Virginis	5.7	2.93	16.1	12 11.5	23 44.3	+10 6.1	−0.6206	0.5238	0.1779	0	−82
85 Virginis	6.5	2.94	14.8	15 16.2	**18** 9 16.3	− 4 39.2	+1.1110	0.5279	0.1681	+75	+29
B. A. C. 4700	5.6	2.90	13.5	15 50.0	21 49.2	+ 7 30.6	−0.2898	0.5340	0.1531	+15	−56
10 Libræ	6.5	+2.84	−10.9	−17 56.8	**19** 17 32.0	+ 2 35.8	−0.7316	0.5441	−0.1249	−13	−90
ι^1 Libræ	5.0	2 81	9.4	19 25.0	**20** 3 2.4	+11 47.5	−0.2498	0.5490	0.1093	+13	−53
ι^2 Libræ	6.5	2.80	9.3	19 16.4	3 33.2	−11 42.7	−0.4601	0.5492	0.1085	+ 1	−69
δ Scorpii	2.6	2.70	5.7	22 20.3	**21** 0 50.1	+ 8 50.8	+0.9439	0.5597	0.0691	+68	+18
ω^2 Scorpii	4.6	2.63	5.8	20 36.0	4 0.2	+11 54.4	−1.1288	0.5610	0.0627	−48	−90
B. A. C. 5395	7.0	+2.61	− 5.2	−21 8.8	6 46.3	− 9 25.4	−0.7098	0.5623	−0.0571	−19	−90
ρ Ophiuchi ~~(S. star)~~	5.0	2.62	3.9	23 13.1	11 57.6	− 4 24.8	+1.2360	0.5644	0.0464	+67	+50
ω Ophiuchi	4.7	2.53	4.1	21 15.2	14 51.2	− 1 37.6	−0.9853	0.5657	0.0403	−38	−90
JUPITER				21 11.9	19 44.6	+ 3 5.3	−1.2122	0.5669	0.0297	−59	−90
15 Ophiuchi	7.3	2.52	2.8	22 54.2	20 28.0	+ 3 47.3	+0.6801	0.5679	0.0283	+63	+ 1
URANUS				−22 14.9	22 34.4	+ 5 49.1	−0.1713	0.5690	−0.0236	+ 7	−49
22 Ophiuchi	6.7	+2.49	− 2.1	23 20.9	**22** 0 38.7	+ 7 49.0	+0.9517	0.5694	0.0191	+67	+19
24 Ophiuchi	5.9	2.47	2.1	22 59.5	1 29.4	+ 8 37.8	+0.5572	0.5696	0.0173	+51	− 6
B. A. C. 5758	6.6	2.38	2.1	21 25.6	5 32.7	−10 27.6	−1.1517	0.5710	−0.0083	−54	−90
52 Ophiuchi	6.5	2.25	0.1	21 58.6	17 54.3	+ 1 26.9	−0.4967	0.5743	+0.0196	−11	−72
B. A. C. 5954	6.8	+2.23	− 0.1	−21 51.2	19 21.7	+ 1 51.2	−0.5947	0.5746	+0.0229	−16	−82
58 Ophiuchi	5.4	2.20	+ 0.1	21 38.1	21 20.7	+ 3 45.8	−0.7740	0.5750	0.0274	−25	−90
Piazzi 17h 330	5.3	2.13	1.6	23 8.4	**23** 5 48.2	+11 54.5	+1.1137	0.5766	0.0467	+67	−34
Piazzi 17h 334	5.3	2.12	1.6	22 50.3	5 56.1	−11 57.9	+0.8060	0.5766	0.0470	+67	+ 9
μ Sagittarii	4.1	2.03	1.4	21 5.1	10 5.3	− 7 57.9	−0.8080	0.5771	0.0565	−25	−90
14 Sagittarii	6.0	+2.04	+ 1.7	−21 44.4	10 17.1	− 7 46.6	−0.1153	0.5772	+0.0569	+14	−45
15 Sagittarii	5.8	2.01	1.4	20 45.5	10 42.2	− 7 22.3	−1.1132	0.5773	0.0579	−47	−90
17 Sagittarii	7.0	2.00	1.4	20 34.6	11 16.8	− 6 49.0	−1.2664	0.5773	0.0592	−65	−90
21 Sagittarii	5.1	1.96	1.8	20 35.7	14 56.7	− 3 17.3	−1.0140	0.5777	0.0675	−37	−90
SATURN				22 21.7	15 16.9	− 2 57.9	+0.8428	0.5761	0.0682	+68	+12
B. A. C. 6336	6.2	+1.91	+ 2.7	−21 28.8	20 10.5	+ 1 44.8	+0.2888	0.5780	+0.0791	+38	−22
B. A. C. 6347	6.0	1.89	2.6	21 8.0	20 35.8	+ 2 9.2	−0.0358	0.5780	0.0802	+20	−40
B. A. C. 6386	7.3	1.83	2.7	20 22.9	**24** 0 21.3	+ 5 46.4	−0.4950	0.5780	0.0885	− 4	−72
29 Sagittarii	5.5	1.82	2.9	20 26.3	1 6.3	+ 6 29.7	−0.3707	0.5781	0.0901	+ 4	−62
33 Sagittarii	6.0	1.82	3.4	21 28.9	2 53.7	+ 8 13.1	+0.8701	0.5782	0.0941	+69	+13
ξ^1 Sagittarii	5.7	+1.78	+ 3.1	−20 47.2	4 18.1	+ 9 43.3	+0.2883	0.5782	+0.0972	+40	−22
ξ^2 Sagittarii	3.5	1.80	3.5	21 14.2	4 27.3	+ 9 43.1	+0.7674	0.5782	0.0975	+69	+ 6
Lalande 35497	6.4	1.73	3.1	19 23.4	6 42.9	+11 53.7	−0.9083	0.5782	0.1024	−27	−90
B. A. C. 6536	5.8	1.71	3.3	19 26.8	8 53.5	−10 0.5	−0.6212	0.5782	0.1071	− 9	−84
d Sagittarii	5.0	1.65	3.5	19 7.8	12 48.4	− 6 14.4	−0.5086	0.5781	0.1154	− 2	−73
ρ^2 Sagittarii	6.5	+1.62	+ 3.5	−18 29.6	14 34.4	− 4 32.3	−0.9535	0.5780	+0.1191	−28	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0		Apparent Declination.	Washington Mean Time.	Hour Angle. H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
B. A. C. 6658	7.3	+1.59	+3.7	−18 33.6	24 17 11.1	− 2 1.5	−0.5654	0.5779	+0.1245	− 4	−78
B. A. C. 6707	6.4	1.55	4.1	19 4.3	20 40.2	+ 1 19.9	+0.4040	0.5776	0.1316	+50	−16
B. A. C. 6710	5.8	1.54	3.9	18 27.2	20 56.4	+ 1 35.4	−0.1923	0.5776	0.1321	+17	−50
B. A. C. 6992	6.7	1.27	4.2	15 5.9	25 15 21.7	− 4 40.2	−0.8279	0.5758	0.1667	−15	−90
β Capricorni	3.2	1.27	4.2	15 5.8	15 27.7	− 4 34.4	−0.8141	0.5758	0.1669	−14	−90
B. A. C. 7087	6.3	+1.20	+4.3	−14 3.8	21 2.4	+ 0 48.1	−0.8942	0.5751	+0.1763	−18	−90
τ^1 Capricorni	7.0	1.20	4.8	15 29.5	22 11.7	+ 2 4.5	+0.7768	0.5749	0.1784	+75	+ 5
τ^2 Capricorni	5.6	1.19	4.8	15 18.3	23 10.7	+ 2 51.6	+0.7338	0.5749	0.1797	+74	+ 2
8 Aquarii	6.8	1.08	4.7	13 26.4	26 7 57.9	+11 19.5	+0.5009	0.5738	0.1930	+62	−11
9 Aquarii	6.8	1.07	4.9	13 55.2	8 28.7	+11 49.2	+1.0803	0.5738	0.1938	+76	+22
ν Aquarii	4.7	+1.02	+4.5	−11 46.5	12 5.9	− 8 41.5	−0.3519	0.5734	+0.1988	+15	−59
17 Aquarii	6.2	0.95	4.2	9 44.7	17 49.0	− 3 11.0	−1.2158	0.5728	0.2055	−40	−90
19 Aquarii	5.8	0.94	4.3	10 10.4	18 47.0	− 2 15.0	−0.5891	0.5727	0.2073	+ 4	−78
B. A. C. 7562	5.5	0.86	4.5	9 29.7	27 3 13.3	+ 5 42.9	+0.5272	0.5720	0.2166	+69	−10
c^1 Capricorni	5.5	0.86	4.5	9 32.4	3 15.4	+ 5 54.9	+0.5798	0.5720	0.2166	+73	− 7
c^2 Capricorni	6.4	+0.86	+4.5	− 9 44.2	3 47.8	+ 6 26.2	+0.8909	0.5720	+0.2171	+80	+11
30 Aquarii	5.8	0.79	4.1	7 0.3	11 6.8	−10 30.7	−0.1996	0.5716	0.2238	+26	−50
B. A. C. 7744	6.7	0.75	3.9	5 12.8	15 11.7	− 6 34.6	−1.0485	0.5711	0.2269	−23	−90
B. A. C. 7752	6.7	0.74	3.8	4 56.8	15 40.8	− 6 6.6	−1.2013	0.5714	0.2273	−34	−90
51 Aquarii	5.8	0.71	4.0	5 20.5	20 4.8	− 1 52.1	+0.1965	0.5714	0.2301	+49	−27
κ Aquarii	5.2	+0.67	+3.9	− 4 44.6	28 1 57.2	+ 3 47.5	+0.9666	0.5714	+0.2332	+85	+17
Lalande 44337	6.3	0.66	3.8	4 4.3	3 15.4	+ 5 2.9	+0.6108	0.5714	0.2337	+78	− 6
3 Piscium	6.4	+0.61	+3.4	− 0 21.0	11 47.7	−10 43.3	−1.0383	0.5718	+0.2363	−21	−90
				NEW	*MOON.*						
APRIL.											
B. A. C. 782	7.0	+0.72	+2.7	+18 26.4	1 4 47.5	+ 2 58.7	−0.9314	0.5875	+0.1495	−16	−82
36 Arietis	6.5	0.76	2.5	17 20.5	9 8.7	+ 7 9.9	+0.8015	0.5879	0.1406	+90	+16
40 Arietis	6.3	+0.77	+2.5	+17 52.1	10 50.8	+ 8 48.1	+0.5107	0.5881	+0.1371	+72	0
ρ^2 Arietis	6.0	0.80	2.4	17 55.6	13 47.2	+11 37.7	+0.8450	0.5884	0.1309	+90	+20
ρ^3 Arietis	6.0	0.80	2.3	17 37.5	14 1.9	+11 51.8	+1.1812	0.5884	0.1303	+90	+47
54 Arietis	6.3	0.85	2.3	18 24.7	18 50.8	− 7 30.4	+0.9936	0.5885	0.1199	+90	+31
δ Arietis	4.0	0.87	2.4	19 21.0	20 9.2	− 6 15.0	+0.2018	0.5885	0.1170	+51	−15
ζ Arietis	4.8	+0.88	+2.6	+20 40.5	21 27.9	− 4 59.4	−0.9871	0.5885	+0.1141	−21	−70
τ^1 Arietis	5.0	0.91	2.5	20 47.3	2 0 0.9	− 2 22.3	−0.8188	0.5885	0.1084	− 9	−69
τ^2 Arietis	5.3	0.91	2.4	20 23.1	0 38.4	− 1 56.2	−0.3441	0.5885	0.1070	+19	−44
65 Arietis	6.0	0.92	2.4	20 27.0	1 18.9	− 1 17.3	−0.3389	0.5885	0.1055	+19	−44
VENUS				21 31.2	7 49.7	+ 4 58.5	−0.7891	0.5429	0.0769	− 8	−68
B. A. C. 1143	6.0	+1.01	+2.0	+20 36.8	9 24.2	+ 6 29.4	+0.2725	0.5879	+0.0869	+55	− 8
B. A. C. 1189	6.0	1.04	2.2	20 56.5	11 35.2	+ 8 35.4	−0.8979	0.5877	0.0818	−15	−68
32 Tauri	6.0	1.07	2.0	22 11.4	14 23.6	+11 17.3	−0.9336	0.5873	0.0752	−17	−68
A^1 Tauri	4.6	1.10	1.7	21 48.5	17 34.2	− 9 39.4	−0.3170	0.5868	0.0677	+20	−39
A^2 Tauri	6.3	1.11	1.7	21 44.4	17 49.7	− 9 24.5	−0.2287	0.5868	0.0671	+25	−33
51 Tauri	6.0	+1.16	+1.2	+21 20.1	23 8.5	− 4 17.9	+0.5105	0.5857	+0.0545	+73	+ 8
53 Tauri	6.0	1.16	1.1	20 54.0	23 34.7	− 3 52.6	+0.9839	0.5856	0.0534	+90	+37
56 Tauri	6.0	1.17	1.2	21 31.9	23 38.4	− 3 49.1	+0.3349	0.5855	0.0530	+59	− 2
χ^1 Tauri	4.7	1.18	1.2	22 3.9	3 1 58.4	− 1 34.4	−0.0968	0.5850	0.0478	+33	−24
χ^2 Tauri	6.3	1.19	1.1	21 58.3	1 59.8	− 1 33.1	+0.0014	0.5850	0.0477	+38	−19
υ^1 Tauri	4.7	+1.21	+1.3	+22 35.2	2 20.8	− 1 12.5	−0.6170	0.5849	+0.0469	+ 3	−58
υ^2 Tauri	6.0	1.22	1.3	22 46.3	2 45.1	− 0 49.4	−0.7884	0.5848	0.0459	− 8	−67
B. A. C. 1373	6.0	1.21	0.9	21 23.5	3 3.9	− 0 31.4	+0.6439	0.5847	0.0452	+88	+16
τ Tauri	4.5	1.29	0.9	22 45.9	8 52.5	+ 5 4.1	−0.5491	0.5830	0.0314	+ 7	−52
B. A. C. 1463	6.3	1.31	+1.0	23 26.7	10 17.1	+ 6 25.4	−1.2116	0.5826	0.0281	−46	−67
ι Tauri	5.0	+1.38	−0.3	+21 26.8	17 30.2	−10 37.7	+1.0061	0.5799	+0.0111	+90	+42

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
105 Tauri	6.0	+1.41	− 0.4	+21 34.3	8 19 30.5	− 8 41.9	+0.8942	0.5791	+0.0064	+90	+35
108 Tauri	6.3	1.45	0.5	22 10.2	22 38.6	− 5 40.8	+0.2791	0.5778	−0.0009	+56	0
n Tauri	5.7	1.47	0.7	21 59.6	4 0 14.5	− 4 8.6	+0.4611	0.5771	0.0045	+69	+10
o Tauri	6.0	1.51	1.0	21 51.1	3 45.3	− 0 45.5	+0.5809	0.5755	0.0125	+81	+16
NEPTUNE				22 6.3	9 53.0	+ 5 8.7	+0.1966	0.5718	0.0263	+50	− 6
B. A. C. 1801	6.0	+1.61	− 1.2	+23 9.4	10 22.7	+ 5 37.3	−0.9258	0.5722	−0.0273	−17	−67
140 Tauri	7.0	1.70	2.0	22 53.6	17 44.2	−11 17.1	−0.9116	0.5683	0.0432	−16	−67
141 Tauri	6.7	1.70	2.2	22 23.8	18 16.6	−10 45.9	−0.4097	0.5680	0.0444	+15	−43
4 Geminorum	7.4	1.75	2.4	23 0.8	22 5.2	− 7 5.4	−1.2498	0.5659	0.0524	−53	−67
6 Geminorum	6.7	1.76	2.5	22 55.8	22 52.9	− 6 19.4	−1.2047	0.5654	0.0540	−45	−67
η Geminorum	3.5	+1.77	− 2.8	+22 32.1	5 0 0.7	− 5 13.9	−0.8473	0.5648	−0.0564	−12	−67
μ Geminorum	3.2	1.81	3.1	22 33.8	3 33.2	− 1 48.9	−1.0926	0.5627	0.0636	−31	−67
14 Geminorum	7.2	1.81	3.5	21 42.0	4 47.2	− 0 37.5	−0.2512	0.5619	0.0660	+24	−35
15 Geminor. ~~(2d star)~~	7.0	1.81	3.9	20 51.0	5 43.1	+ 0 16.4	+0.5928	0.5614	0.0679	+81	+11
16 Geminorum	6.8	1.81	4.0	20 33.3	5 47.9	+ 0 21.0	+0.9048	0.5614	0.0680	+90	+29
ν Geminorum	4.2	+1.81	− 4.1	+20 16.5	6 15.2	+ 0 47.4	+1.1708	0.5611	−0.0689	+90	+51
ζ Geminorum	4.0	2.00	5.6	20 42.9	22 5.7	− 7 54.7	−0.6298	0.5513	0.0985	+ 3	−64
f Geminorum	6.0	2.14	8.2	17 54.0	6 14 41.7	+ 8 8.5	+0.5511	0.5411	0.1255	+76	+ 2
g Geminorum	5.3	2.18	8.2	18 45.1	17 52.0	+11 12.7	−0.7806	0.5391	0.1302	− 6	−71
3 Cancri	6.0	2.23	9.3	17 34.8	7 0 59.2	− 5 53.7	−0.4691	0.5350	0.1402	+12	−57
5 Cancri	6.3	+2.23	− 9.6	+16 43.7	1 21.1	− 5 32.4	+0.4086	0.5347	−0.1407	+64	− 7
29 Cancri	6.0	2.33	11.5	14 32.3	14 49.5	+ 7 31.0	+0.7951	0.5273	0.1577	+90	+12
A^1 Cancri	6.0	2.37	12.6	13 2.2	22 13.9	− 9 18.0	+1.2496	0.5236	0.1659	+90	+47
a^2 Cancri	4.0	2.43	13.5	12 14.5	8 6 5.3	− 1 40.7	+0.7926	0.5199	0.1737	+90	+10
κ Cancri	5.1	2.46	14.2	11 4.0	10 55.1	+ 3 0.6	+1.2391	0.5180	0.1781	+90	+44
ω Leonis	5.9	+2.53	−15.4	+ 9 29.3	21 49.5	−10 24.0	+0.9938	0.5140	−0.1870	+90	+21
h Leonis	5.7	2.55	15.3	10 9.2	23 40.7	− 8 36.0	−0.0890	0.5134	0.1883	+33	−40
o Leonis	3.8	2.56	15.5	10 20.6	9 4 35.0	− 3 50.1	−1.2324	0.5111	0.1916	−39	−80
11 Sextantis	6.0	2.64	16.4	8 47.2	13 43.0	+ 5 2.4	−1.2853	0.5095	0.1971	−45	−81
π Leonis	5.0	2.64	16.6	8 31.2	14 52.4	+ 6 8.8	−1.3140	0.5092	0.1977	−37	−81
14 Sextantis	6.6	+2.65	−17.4	+ 6 5.7	18 27.4	+ 9 38.7	+0.7611	0.5085	−0.1995	+90	+ 4
16 Sextantis	6.9	2.66	17.3	6 39.4	19 45.9	+10 55.0	−0.1236	0.5082	0.2001	+31	−44
19 Sextantis	6.2	2.67	17.8	5 6.2	21 43.0	−11 11.1	+1.2077	0.5079	0.2010	+90	+36
34 Sextantis	6.7	2.76	18.6	4 6.0	10 14 0.8	+ 4 39.5	−1.0021	0.5061	0.2065	−19	−86
36 Sextantis	6.6	2.77	18.8	3 0.4	15 24.5	+ 6 0.9	−0.0780	0.5060	0.2068	+34	−42
55 Leonis	6.2	+2.80	−19.3	+ 1 15.9	21 11.8	+11 38.6	+0.6591	0.5059	−0.2078	+84	− 3
57 Leonis	6.9	2.80	19.4	0 57.7	21 27.8	+11 54.2	+0.9410	0.5059	0.2079	+90	+14
p^2 Leonis	5.4	2.82	19.5	0 31.9	11 1 32.8	− 8 7.6	+0.5672	0.5060	0.2084	+75	− 8
p^6 Leonis	5.7	2.85	19.6	+ 0 28.1	7 6.9	− 2 42.7	−0.5240	0.5063	0.2087	+10	−72
e Leonis	5.3	2.90	20.1	− 2 27.4	16 11.2	+ 6 6.5	+0.8315	0.5072	0.2084	+87	+ 7
B. A. C. 4006	6.1	+2.96	−20.3	− 4 47.0	12 3 28.8	− 6 54.7	+1.0653	0.5091	−0.2065	+85	+23
q Virginis	5.7	3.09	19.9	8 54.4	18 2 24.7	− 8 37.8	+0.9777	0.5155	0.1975	+81	+17
χ Virginis	5.2	3.09	19.6	7 27.1	5 18.3	− 5 49.2	−1.1977	0.5166	0.1958	−46	−90
ψ Virginis	5.2	3.13	19.3	9 0.1	13 13.2	+ 1 51.9	−1.0162	0.5196	0.1907	−22	−90
g Virginis	5.9	3.17	18.9	10 12.6	20 14.1	+ 8 40.4	−1.0022	0.5225	0.1854	−23	−90
i Virginis	5.7	+3.22	−18.2	−12 11.6	14 5 51.2	− 5 59.5	−0.5654	0.5267	−0.1768	+ 3	−76
85 Virginis	6.5	3.28	17.2	15 16.2	15 18.3	+ 3 10.3	+1.1805	0.5315	0.1671	+75	+36
B. A. C. 4700	5.6	3.31	15.8	15 50.0	15 3 44.3	− 8 46.9	−0.1924	0.5379	0.1522	+20	−50
B. A. C. 4896	6.6	3.34	15.7	17 22.7	23 9.0	+10 0.4	−1.2006	0.5480	0.1242	−48	−90
10 Libræ	6.5	3.35	13.1	17 56.8	23 16.2	+10 7.4	−0.5989	0.5480	0.1240	− 5	−81
ι^1 Libræ	5.0	+3.37	−11.6	−19 25.0	16 8 41.9	− 4 45.7	−0.1035	0.5528	−0.1084	+20	−44
ι^2 Libræ	6.5	3.37	11.5	19 16.4	9 12.4	− 4 16.2	−0.3125	0.5531	0.1076	+ 9	−57
B. A. C. 5109	6.2	3.36	10.1	19 20.0	17 59.8	+ 4 13.4	−1.1243	0.5573	0.0918	−44	−90
δ Scorpii	2.6	3.37	7.5	22 20.4	17 6 21.3	− 7 50.6	+1.1192	0.5627	0.0681	+68	+34
ω^1 Scorpii	4.6	3.31	7.4	20 24.0	9 15.1	− 5 2.9	−1.1486	0.5639	0.0623	−49	−90
ω^2 Leonis	4.6	+3.31	− 7.3	−20 36.0	9 30.6	− 4 47.8	−0.9499	0.5639	−0.0617	−33	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x'*	*y'*	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
B. A. C. 5395	7.0	+3.32	−6.7	−21 8.8	**17** 12 16.1	− 2 8.2	−0.5276	0.5651	−0.0561	− 8	−75
ω Ophiuchi	4.7	3.27	5.3	21 15.1	20 20.0	+ 5 38.6	−0.7954	0.5678	0.0393	−25	−90
JUPITER				21 4.6	23 57.2	+ 9 8.0	−1.1114	0.5718	0.0320	−49	−90
15 Ophiuchi	7.3	3.28	3.9	22 59.9	**18** 1 56.6	+11 3.2	+0.8781	0.5695	0.0272	+68	+15
URANUS				22 11.8	3 16.1	−11 40.2	−0.0098	0.5710	0.0245	+16	−38
22 Ophiuchi	6.7	+3.26	−3.0	−23 21.0	6 7.4	− 8 55.0	+1.1545	0.5706	−0.0182	+68	+40
24 Ophiuchi	5.9	3.24	3.0	22 59.3	6 58.3	− 8 6.0	+0.7600	0.5708	0.0163	+68	+ 7
B. A. C. 5758	6.6	3.17	2.7	21 25.6	11 2.2	− 4 10.8	−0.9502	0.5717	−0.0073	−38	−90
52 Ophiuchi	6.5	3.07	0.3	21 58.6	23 27.4	+ 7 47.5	−0.2849	0.5738	+0.0203	+ 1	−56
B. A. C. 5954	6.8	3.05	−0.1	21 51.2	**19** 0 55.5	+ 9 12.4	−0.3823	0.5740	0.0236	− 4	−63
58 Ophiuchi	5.4	+3.03	+0.2	−21 38.1	2 55.3	+11 7.8	−0.5616	0.5742	+0.0280	−13	−78
B. A. C. 6098	6.0	2.92	1.3	20 44.2	11 4.8	− 5 0.5	−1.2006	0.5746	0.0462	−56	−90
Piazzi 17^h 334	5.3	2.96	2.0	22 50.3	11 35.8	− 4 30.8	+1.0322	0.5747	0.0474	+68	+26
μ Sagittarii	4.1	2.88	2.2	21 5.1	15 47.9	− 0 27.9	−0.5907	0.5747	0.0567	−10	−81
14 Sagittarii	6.0	2.89	2.4	21 44.3	15 59.9	− 0 16.4	+0.1070	0.5747	0.0571	+26	−32
15 Sagittarii	5.8	+2.86	+2.2	−20 45.4	16 25.2	+ 0 8.1	−0.8977	0.5747	+0.0581	−30	−90
16 Sagittarii	6.6	2.86	2.1	20 25.0	16 25.6	+ 0 8.4	−1.2538	0.5747	0.0581	−61	−90
17 Sagittarii	7.0	2.85	2.2	20 34.6	17 0.4	+ 0 42.0	−1.0523	0.5747	0.0593	−41	−90
21 Sagittarii	5.1	2.81	2.8	20 35.7	20 43.2	+ 4 16.6	−0.7968	0.5746	0.0675	−23	−90
SATURN				22 20.2	21 39.3	+ 5 10.3	+1.0898	0.5750	0.0695	+68	+31
B. A. C. 6336	6.2	+2.76	+3.9	−21 28.8	**20** 2 2.0	+ 9 23.7	+0.5179	0.5743	+0.0790	+53	− 9
B. A. C. 6347	6.0	2.75	3.8	21 8.0	2 27.3	+ 9 48.1	+0.1901	0.5743	0.0799	+33	−27
B. A. C. 6386	7.3	2.69	4.2	20 22.9	6 17.0	−10 30.6	−0.2720	0.5740	0.0880	+ 9	−55
29 Sagittarii	5.5	2.68	4.3	20 26.2	7 2.7	− 9 46.5	−0.1465	0.5739	0.0897	+15	−47
33 Sagittarii	6.0	2.68	4.9	21 28.8	8 52.1	− 8 0.9	+1.1059	0.5739	0.0935	+70	+32
ξ¹ Sagittarii	5.7	+2.63	+4.7	−20 47.2	10 18.1	− 6 38.3	+0.5192	0.5736	+0.0965	+55	− 9
ξ² Sagittarii	3.5	2.65	5.1	21 14.2	10 27.2	− 6 29.6	+1.0024	0.5735	0.0968	+70	+22
Lalande 34497	6.4	2.59	4.8	19 23.3	12 45.7	− 4 16.1	−0.6890	0.5733	0.1016	−13	−90
B. A. C. 6536	5.8	2.55	5.0	19 26.7	14 59.0	− 2 7.6	−0.3990	0.5730	0.1061	+ 3	−64
d Sagittarii	5.0	2.50	5.5	19 7.8	18 59.0	+ 1 43.6	−0.2875	0.5724	0.1142	+10	−56
ρ¹ Sagittarii	4.2	+2.46	+5.4	−18 2.1	20 43.7	+ 3 24.5	−1.2196	0.5721	+0.1177	−52	−90
ρ² Sagittarii	6.5	2.47	5.5	18 29.5	20 47.3	+ 3 28.0	−0.7356	0.5721	0.1178	−14	−90
B. A. C. 6707	6.4	2.39	6.5	19 4.3	**21** 3 1.8	+ 9 29.0	+0.6361	0.5711	0.1298	+67	− 2
B. A. C. 6710	5.8	2.38	6.4	18 27.1	3 18.5	+ 9 45.0	+0.0335	0.5711	0.1304	+29	−36
B. A. C. 6992	6.7	2.07	7.2	15 5.9	22 14.3	+ 4 0.1	−0.6179	0.5674	0.1637	− 3	−82
β Capricorni	3.2	+2.07	+7.2	−15 5.7	22 20.4	+ 4 6.0	−0.6045	0.5674	+0.1639	− 2	−81
B. A. C. 7087	6.3	1.98	7.4	14 3.8	**22** 4 5.5	+ 9 38.8	−0.6889	0.5664	0.1729	− 6	−90
τ¹ Capricorni	7.0	1.98	8.0	15 29.5	5 27.2	+10 57.6	+1.0056	0.5661	0.1749	+75	+21
τ² Capricorni	5.6	1.97	8.0	15 18.2	6 17.8	+11 46.3	+0.9615	0.5660	0.1762	+76	+17
8 Aquarii	6.8	1.83	8.1	13 26.3	15 22.1	− 3 28.6	+0.7181	0.5644	0.1889	+77	+ 1
ν Aquarii	4.7	+1.76	+7.8	−11 46.5	19 38.5	+ 0 38.8	−0.1517	0.5638	+0.1944	+26	−47
B. A. C. 7408	6.9	1.67	7.5	9 45.0	**23** 1 7.8	+ 5 56.5	−1.1144	0.5630	0.2009	−31	−90
17 Aquarii	6.2	1.67	7.5	9 44.6	1 33.4	+ 6 21.2	−1.0327	0.5630	0.2014	−24	−90
19 Aquarii	5.8	1.66	7.6	10 10.3	2 33.4	+ 7 19.1	−0.3998	0.5628	0.2025	+13	−63
ξ Aquarii	4.8	1.58	7.3	8 18.0	8 7.1	−11 18.9	−1.1446	0.5623	0.2084	−33	−90
B. A. C. 7562	5.5	+1.54	+7.9	− 9 29.7	11 17.2	− 8 15.4	+0.7239	0.5620	+0.2115	+80	+ 1
*c*¹ Capricorni	5.5	1.54	7.9	9 32.4	11 19.4	− 8 13.3	+0.7774	0.5620	0.2115	+68	+ 4
*c*² Capricorni	6.4	1.54	8.0	9 44.1	11 52.9	− 7 40.9	+1.0927	0.5620	0.2120	+81	+26
30 Aquarii	5.8	1.43	7.4	7 0.2	19 27.2	− 0 22.5	−0.0260	0.5616	0.2134	+35	−40
B. A. C. 7744	6.7	1.38	7.0	5 12.7	23 40.6	+ 3 42.1	−0.8949	0.5615	0.2214	−12	−90
B. A. C. 7752	6.7	+1.37	+6.9	4 56.7	**24** 0 10.7	+ 4 11.1	−1.0510	0.5615	+0.2218	−23	−90
51 Aquarii	5.8	1.32	7.2	5 20.5	4 43.7	+ 8 34.7	+0.3621	0.5615	0.2246	+59	−19
κ Aquarii	5.2	1.26	7.0	4 44.5	10 48.0	− 9 33.7	+1.1343	0.5618	0.2276	+86	+29
Lalande 44337	6.3	1.24	6.9	4 4.3	12 8.8	− 8 15.7	+0.7706	0.5619	0.2281	+77	+ 4
3 Piscium	6.4	1.15	6.1	− 0 20.9	20 57.7	+ 0 14.7	−0.9197	0.5628	0.2307	−13	−90
κ Piscium	4.7	+1.04	+5.9	+ 0 42.6	**25** 8 34.4	+11 27.0	+0.7128	0.5646	+0.2313	+90	0

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
9 Piscium	6.6	+1.04	+ 5.9	+ 0 34.5	**25** 8 42.8	+11 35.1	+0.8795	0.5646	+0.2313	+90	+10
16 Piscium	5.8	1.01	5.7	1 32.9	12 44.3	− 8 31.9	+0.8401	0.5655	0.2308	+90	+ 8
19 Piscium	4.9	0.97	5.4	2 56.0	17 7.1	− 4 18.4	+0.4737	0.5665	0.2297	+68	−13
d Piscium	5.3	0.88	4.4	7 38.2	**26** 7 57.9	+10 0.7	−0.8280	0.5707	0.2226	− 8	−82
45 Piscium	6.9	+0.87	+ 4.4	+ 7 8.4	10 9.5	−11 52.3	+0.1511	0.5715	+0.2211	+47	−28
				NEW	*MOON.*						

MAY.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
ι Tauri	5.0	+1.10	− 1.2	+21 26.8	**1** 3 13.0	+ 0 53.1	+0.8508	0.5871	+0.0101	+90	+32
105 Tauri	6.0	1.12	1.3	21 34.3	5 10.8	+ 2 46.5	+0.7375	0.5870	+0.0054	+90	+25
108 Tauri	6.3	1.15	1.4	22 10.2	8 14.7	+ 5 43.4	+0.1244	0.5859	−0.0019	+46	− 8
n Tauri	5.7	1.16	1.6	21 59.6	9 48.6	+ 7 13.6	+0.3055	0.5858	0.0056	+57	+ 1
o Tauri	6.0	1.19	1.8	21 51.1	13 14.8	+10 32.1	+0.4177	0.5836	0.0137	+65	+ 7
ζ Tauri	3.3	+1.23	− 2.3	+21 4.9	17 23.8	− 9 28.3	+1.1448	0.5816	−0.0233	+90	+53
B. A. C. 1801	6.0	1.27	2.0	23 9.4	19 43.1	− 7 14.3	−1.0806	0.5804	0.0286	−31	−67
NEPTUNE				22 8.9	20 22.5	− 6 36.3	−0.0479	0.5788	0.0300	+35	−20
140 Tauri	7.0	1.28	3.1	22 53.6	**2** 2 54.5	− 0 18.8	−1.1232	0.5763	0.0446	−30	−67
141 Tauri	6.7	1.33	2.8	22 23.8	3 26.1	+ 0 10.6	−0.5769	0.5761	0.0458	+55	−55
η Geminorum	3.5	+1.38	− 3.2	+22 32.1	9 2.3	+ 5 35.6	−1.0147	0.5727	−0.0578	−24	−67
μ Geminorum	3.2	1.42	3.5	22 33.8	12 29.8	+ 8 54.7	−1.2601	0.5706	0.0651	−55	−67
14 Geminorum	7.2	1.42	3.8	21 42.0	13 42.2	+10 5.4	−0.4284	0.5698	0.0675	+14	−46
15 Geminor. ~~(cluster)~~	7.0	1.42	4.2	20 51.0	14 36.7	+10 57.9	+0.4061	0.5692	0.0694	+64	+ 1
16 Geminorum	6.8	1.42	4.2	20 33.3	14 41.5	+11 2.1	+0.7117	0.5692	0.0695	+90	+18
ν Geminorum	4.2	+1.42	− 4.4	+20 16.5	15 8.1	+11 28.2	+0.9777	0.5689	−0.0704	+90	+35
ζ Geminorum	4.0	1.57	5.5	20 42.9	**3** 6 37.4	+ 2 24.4	−0.8143	0.5584	0.1000	− 9	−69
f Geminorum	6.0	1.70	7.7	17 54.0	22 53.0	− 5 52.3	+0.3477	0.5470	0.1270	+60	− 9
g Geminorum	5.3	1.74	7.7	18 45.1	**4** 1 59.6	− 2 51.9	−0.9721	0.5449	0.1316	−17	−71
1 Cancri	6.3	1.76	9.0	16 3.3	7 11.7	+ 2 10.1	+1.2342	0.5414	0.1391	+90	+50
3 Cancri	6.0	+1.79	− 8.6	+17 34.8	8 59.0	+ 3 53.9	−0.6653	0.5402	−0.1416	+ 1	−70
5 Cancri	6.3	1.79	8.9	16 43.7	9 20.5	+ 4 14.7	+0.2051	0.5399	0.1420	+50	−18
29 Cancri	6.0	1.89	10.6	14 32.3	22 36.0	− 6 54.8	+0.5871	0.5314	0.1586	+79	0
A^1 Cancri	6.0	1.95	11.6	13 2.2	**5** 5 54.1	+ 0 9.8	+1.0392	0.5272	0.1666	+90	+28
60 Cancri	6.0	2.00	12.4	12 0.3	12 21.8	+ 6 25.7	+1.0718	0.5248	0.1730	+90	+29
α^2 Cancri	4.0	+2.02	−12.4	+12 14.5	13 39.8	+ 7 41.4	+0.5875	0.5229	−0.1742	+78	− 2
κ Cancri	5.1	2.05	13.1	11 4.0	18 26.5	−11 40.4	+1.0326	0.5205	0.1785	+90	+25
ω Leonis	5.9	2.14	14.2	9 29.3	**6** 5 14.7	− 1 11.1	+0.7945	0.5156	0.1870	+90	+ 8
h Leonis	5.7	2.16	14.1	10 9.2	7 5.1	+ 0 36.1	−0.2819	0.5150	0.1883	+23	−51
14 Sextantis	6.6	2.30	16.3	6 5.7	**7** 1 43.9	− 5 17.1	+0.5803	0.5088	0.1988	+77	− 6
16 Sextantis	6.9	+2.32	−16.1	+ 6 39.4	3 3.2	− 4 0.0	−0.3038	0.5085	−0.1994	+22	−55
19 Sextantis	6.2	2.33	16.7	5 6.3	4 59.8	− 2 6.7	+1.0244	0.5080	0.2002	+90	+21
34 Sextantis	6.7	2.47	17.4	4 6.0	21 15.2	−10 18.5	−1.1643	0.5056	0.2052	−31	−86
36 Sextantis	6.6	2.48	17.8	3 0.5	22 38.7	− 8 57.3	−0.2411	0.5055	0.2055	+25	−52
55 Leonis	6.2	2.53	18.5	1 15.9	**8** 4 25.7	− 3 19.9	+0.4999	0.5054	0.2065	+69	−11
57 Leonis	6.9	+2.53	−18.6	+ 0 57.7	4 41.6	− 3 4.3	+0.7817	0.5053	−0.2065	+90	+ 4
p^2 Leonis	5.4	2.54	18.7	+ 0 31.9	8 46.3	+ 0 53.5	+0.4134	0.5051	0.2069	+63	−16
p^4 Leonis	6.9	2.58	19.2	− 0 47.8	11 51.9	+ 3 54.0	+1.2459	0.5051	0.2071	+89	+39
p^5 Leonis	5.7	2.61	18.8	+ 0 28.2	14 20.5	+ 6 18.6	−0.6696	0.5053	0.2071	+ 2	−85
e Leonis	5.3	2.70	19.6	− 2 27.4	23 24.7	− 8 52.4	+0.6945	0.5064	0.2067	+87	− 1
B. A. C. 4006	6.1	+2.80	−20.1	− 4 47.0	**9** 10 42.5	+ 2 6.6	+0.9422	0.5081	−0.2048	+85	+15
q Virginis	5.7	3.02	20.2	8 54.4	**10** 9 37.9	+ 0 23.1	+0.8861	0.5151	0.1959	+81	+11
χ Virginis	5.2	3.03	19.7	7 27.1	12 31.4	+ 3 11.6	−1.2814	0.5162	0.1943	−47	−90
ψ Virginis	5.2	3.11	19.5	9 0.1	20 25.3	+10 51.7	−1.0851	0.5195	0.1892	−28	−90
g Virginis	5.9	3.18	19.3	10 12.7	**11** 3 25.1	− 6 20.9	−1.0641	0.5227	0.1840	−27	−90
i Virginis	5.7	+3.25	−18.8	−12 11.6	13 0.0	+ 2 56.8	−0.6144	0.5276	−0.1757	0	−82

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
85 Virginis	6.5	+3.39	−18.3	−15 16.2	11 22 24.3	−11 56.1	+1.1393	0.5327	−0.1661	+75	+32
B. A. C. 4700	5.6	3.49	16.9	15 50.1	12 10 45.2	+ 0 1.9	−0.2116	0.5399	0.1514	+19	−51
B. A. C. 4896	6.6	3.63	14.2	17 22.7	13 5 59.2	− 5 21.8	−1.1900	0.5513	0.1237	−47	−90
10 Libræ	6.5	3.64	14.2	17 56.8	6 6.3	− 5 14.9	−0.5892	0.5513	0.1235	− 5	−80
ι¹ Libræ	5.0	3.72	12.7	19 25.0	15 25.7	+ 3 45.7	−0.0851	0.5570	0.1079	+21	−43
ι² Libræ	6.5	+3.72	−12.6	−19 16.5	15 55.8	+ 4 14.8	−0.2927	0.5570	−0.1070	+ 9	−56
B. A. C. 5109	6.2	3.75	11.0	19 20.0	14 0 36.7	−11 22.2	−1.0896	0.5616	0.0913	−41	−90
λ Libræ	4.4	3.78	9.3	19 52.3	9 47.5	− 2 30.6	−1.2675	0.5662	0.0736	−64	−90
δ Scorpii	2.6	3.85	8.6	22 20.4	12 48.3	+ 0 23.9	+1.1554	0.5676	0.0675	+68	+38
ω¹ Scorpii	4.6	3.80	8.1	20 24.1	15 39.6	+ 3 9.1	−1.0964	0.5688	0.0617	−45	−90
ω² Scorpii	4.6	+3.81	− 8.1	−20 36.1	15 54.9	+ 3 23.9	−0.8986	0.5689	−0.0612	−30	−90
B. A. C. 5395	7.0	3.82	7.5	21 8.8	18 38.1	+ 6 1.3	−0.4758	0.5700	0.0552	− 6	−70
ω Ophiuchi	4.7	3.83	5.8	21 15.2	15 2 35.1	−10 18.8	−0.7339	0.5730	0.0386	−23	−90
URANUS				22 4.7	7 46.0	− 5 19.2	−0.0297	0.5764	0.0275	+16	−40
15 Ophiuchi	7.3	3.87	4.4	22 59.9	8 6.9	− 4 59.0	+0.9355	0.5748	0.0265	+67	+18
22 Ophiuchi	6.7	+3.87	− 3.5	−23 21.0	12 14.1	− 1 0.8	+1.2144	0.5759	−0.0174	+67	+47
24 Ophiuchi	5.9	3.86	3.4	22 59.5	13 4.2	− 0 12.6	+0.8232	0.5762	0.0155	+67	+10
B. A. C. 5758	6.6	3.80	− 2.7	21 25.6	17 4.7	+ 3 39.2	−0.8745	0.5771	−0.0065	−33	−90
52 Ophiuchi	6.5	3.76	0.0	21 58.6	16 5 19.9	− 8 32.7	−0.2024	0.5789	+0.0213	+ 5	−50
B. A. C. 5954	6.8	3.75	+ 0.3	21 51.2	6 46.7	− 7 9.1	−0.2983	0.5790	0.0246	+ 1	−57
58 Ophiuchi	5.4	+3.73	+ 0.7	−21 38.1	8 45.1	− 5 15.1	−0.4752	0.5792	+0.0291	− 8	−70
B. A. C. 6098	6.0	3.66	2.2	20 44.2	16 48.7	+ 2 30.6	−1.1059	0.5793	0.0473	−47	−90
Piazzi 17ʰ 334	5.3	3.71	2.8	22 50.3	17 19.2	+ 2 59.9	+1.1184	0.5793	0.0485	+67	+34
μ Sagittarii	4.1	3.63	3.3	21 5.1	21 28.6	+ 7 0.1	−0.4954	0.5792	0.0579	− 7	−72
14 Sagittarii	6.0	3.65	3.4	21 44.3	21 40.5	+ 7 11.6	+0.1999	0.5792	0.0583	+30	−27
15 Sagittarii	5.8	+3.62	+ 3.3	−20 45.4	22 5.5	+ 7 35.7	−0.8010	0.5792	+0.0592	−24	−90
16 Sagittarii	6.6	3.61	3.2	20 25.0	22 6.0	+ 7 36.1	−1.1557	0.5792	0.0592	−50	−90
17 Sagittarii	7.0	3.61	3.4	20 34.6	22 40.3	+ 8 9.2	−0.9547	0.5791	0.0605	−34	−90
SATURN				22 21.7	17 1 44.7	+11 6.8	+1.1055	0.5810	0.0674	+68	+32
21 Sagittarii	5.1	3.58	4.1	20 35.6	2 21.0	+11 41.8	−0.6978	0.5791	0.0686	−17	−90
B. A. C. 6336	6.2	+3.55	+ 5.4	−21 28.8	7 36.8	− 7 14.0	+0.6162	0.5781	+0.0801	+61	− 3
B. A. C. 6347	6.0	3.54	5.4	21 8.0	8 2.1	− 6 49.7	+0.2897	0.5781	0.0810	+39	−22
B. A. C. 6386	7.3	3.49	6.0	20 22.9	11 49.9	− 3 10.3	−0.1720	0.5774	0.0891	+14	−48
29 Sagittarii	5.5	3.49	6.1	20 26.2	12 35.2	− 2 26.6	−0.0437	0.5773	0.0907	+21	−41
33 Sagittarii	6.0	3.49	6.7	21 28.8	14 23.8	− 0 42.0	+1.2077	0.5770	0.0946	+69	+44
ζ¹ Sagittarii	5.7	+3.45	+ 6.7	−20 47.1	15 49.2	+ 0 30.2	+0.6226	0.5767	+0.0976	+63	− 3
ζ² Sagittarii	3.5	3.47	6.9	21 14.2	15 58.6	+ 0 49.2	+1.1058	0.5767	0.0979	+69	+33
Lalande 35497	6.4	3.40	6.9	19 23.3	18 16.0	+ 3 1.6	−0.5824	0.5762	0.1026	− 7	−80
B. A. C. 6536	5.8	3.38	7.3	19 26.7	20 28.5	+ 5 9.3	−0.2919	0.5757	0.1071	+10	−56
d Sagittarii	5.0	3.33	7.9	19 7.7	18 0 27.3	+ 8 59.3	−0.1768	0.5748	0.1150	+16	−49
ρ¹ Sagittarii	4.2	+3.29	+ 7.9	−18 2.0	2 11.7	+10 39.9	−1.1067	0.5743	+0.1185	−40	−90
ρ² Sagittarii	6.5	3.30	8.1	18 29.5	2 15.4	+10 43.5	−0.6257	0.5743	0.1186	− 8	−84
B. A. C. 6707	6.4	3.23	9.3	19 4.3	8 28.9	− 7 16.6	+0.7490	0.5726	0.1306	+71	+ 4
B. A. C. 6710	5.8	3.22	9.2	18 27.1	8 45.5	− 7 0.7	+0.1454	0.5724	0.1310	+35	−30
B. A. C. 6992	6.7	2.92	10.8	15 5.8	19 3 43.2	+11 16.2	−0.5027	0.5668	0.1637	+ 4	−71
β Capricorni	3.2	+2.92	+10.8	−15 5.7	3 49.3	+11 22.1	−0.4880	0.5668	+0.1638	+ 5	−70
B. A. C. 7087	6.3	2.83	11.2	14 3.7	9 36.5	− 7 2.9	−0.5737	0.5650	0.1726	+ 1	−77
τ¹ Capricorni	7.0	2.83	11.8	15 29.4	10 58.8	− 5 43.5	+1.1283	0.5647	0.1745	+75	+31
τ² Capricorni	5.6	2.82	11.9	15 18.1	11 49.8	− 4 54.4	+1.0842	0.5644	0.1757	+75	+27
8 Aquarii	6.8	2.67	12.2	13 26.3	20 59.4	+ 3 56.0	+0.8415	0.5618	0.1880	+77	+ 9
ν Aquarii	4.7	+2.60	+12.0	−11 46.4	20 1 18.8	+ 8 6.5	−0.0311	0.5605	+0.1932	+32	−40
B. A. C. 7408	6.9	2.50	11.7	9 45.0	6 52.6	−10 31.3	−1.0045	0.5592	0.1994	−22	−90
17 Aquarii	6.2	2.50	11.8	9 44.5	7 18.6	−10 6.2	−0.9250	0.5591	0.1999	−17	−90
19 Aquarii	5.8	2.49	11.9	10 10.3	8 19.5	− 9 7.3	−0.2848	0.5589	0.2009	+20	−55
ξ Aquarii	4.8	2.40	11.8	8 18.0	13 58.6	− 3 39.9	−1.0373	0.5577	0.2065	−24	−90
B. A. C. 7562	5.5	+2.37	+12.4	− 9 29.6	17 12.1	− 0 33.1	+0.8468	0.5571	+0.2093	+81	+ 9

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
c^1 Capricorni	5.5	+2.37	+12.4	− 9 32.3	**20** 17 14.4	− 0 30.9	+0.9009	0.5570	+0.2094	+80	+12
c^2 Capricorni	6.4	2.36	12.5	9 44.1	17 48.5	+ 0 2.1	+1.2190	0.5569	0.2098	+80	+38
30 Aquarii	5.8	2.25	12.0	7 0.1	**21** 1 31.7	+ 7 29.4	+0.0878	0.5557	0.2158	+41	−33
B. A. C. 7744	6.7	2.18	11.6	5 12.6	5 50.5	+11 39.5	−0.7918	0.5552	0.2186	− 6	−90
B. A. C. 7752	6.7	2.17	11.5	4 56.6	6 21.4	−11 50.8	−0.9495	0.5552	0.2189	−15	−90
51 Aquarii	5.8	+2.11	+11.8	− 5 20.4	11 0.7	− 7 20.9	+0.4756	0.5548	+0.2214	+67	−13
κ Aquarii	5.2	2.03	11.8	4 44.4	17 13.8	− 1 20.5	+1.2552	0.5545	0.2241	+85	+40
Lalande 44337	6.3	2.02	11.6	4 4.2	18 36.6	− 0 0.4	+0.8864	0.5545	0.2246	+86	+11
3 Piscium	6.4	1.90	10.5	− 0 20.9	**22** 3 39.5	+ 8 44.1	−0.8300	0.5548	0.2268	− 7	−90
κ Piscium	4.7	1.76	10.2	+ 0 42.6	15 36.0	− 3 43.7	+0.8162	0.5562	0.2271	+90	+ 6
9 Piscium	6.6	+1.76	+10.2	+ 0 34.5	15 44.7	− 3 35.3	+0.9852	0.5562	+0.2271	+90	+18
16 Piscium	5.8	1.71	9.9	1 33.0	19 53.3	+ 0 24.8	+0.9432	0.5568	0.2265	+90	+15
19 Piscium	4.9	1.66	9.4	2 56.1	**23** 0 23.9	+ 4 46.1	+0.5636	0.5577	0.2254	+75	− 7
36 Piscium	6.3	1.54	7.8	7 41.2	13 54.2	− 6 11.5	−1.2072	0.5612	0.2193	−36	−82
d Piscium	5.3	1.52	7.7	7 38.2	15 41.5	− 4 28.1	−0.7655	0.5618	0.2182	− 3	−76
45 Piscium	6.9	+1.50	+ 7.8	+ 7 8.4	17 57.1	− 2 17.1	+0.2254	0.5631	+0.2167	+51	−24
101 Piscium	6.3	1.29	5.0	14 9.1	**25** 0 21.2	+ 3 2.2	−0.6648	0.5742	0.1852	+ 1	−74
104 Piscium	7.5	1.28	5.0	13 46.8	1 50.0	+ 4 27.7	−0.0174	0.5748	0.1832	+36	−32
27 Arietis	6.3	1.18	3.2	17 15.7	23 24.3	+ 1 14.0	+0.0563	0.5835	0.1478	+41	−25
B. A. C. 782	7.0	1.18	2.9	18 26.4	**26** 0 30.2	+ 2 17.5	−0.9730	0.5839	0.1457	−19	−72
36 Arietis	6.5	+1.16	+ 2.8	+17 20.5	4 55.2	+ 6 32.5	+0.7632	0.5854	+0.1372	+90	+14
40 Arietis	6.3	1.15	2.6	17 52.1	6 38.3	+ 8 11.7	+0.4632	0.5859	0.1338	+68	− 3
ρ^2 Arietis	6.0	1.14	2.4	17 55.6	9 36.7	+11 3.3	+0.7928	0.5869	0.1279	+90	+17
ρ^3 Arietis	6.0	1.15	2.4	17 37.5	9 51.4	+11 17.4	+1.1301	0.5870	0.1273	+90	+41
54 Arietis	6.3	1.13	2.0	18 24.7	14 42.3	− 8 2.8	+0.9270	0.5884	0.1173	+90	+27
δ Arietis	4.0	+1.14	+ 1.8	+19 21.0	16 1.1	− 6 47.0	+0.1281	0.5887	+0.1145	+46	−18
ζ Arietis	4.8	1.14	1.6	20 40.5	17 20.1	− 5 31.1	−1.0688	0.5891	0.1117	−28	−69
τ^1 Arietis	5.0	1.14	1.5	20 47.2	19 53.5	− 3 3.5	−0.9056	0.5896	0.1061	−15	−69
τ^2 Arietis	5.3	1.13	1.5	20 23.1	20 31.0	− 2 47.4	−0.4287	0.5897	0.1047	+14	−49
65 Arietis	6.0	+1.13	+ 1.4	+20 27.0	21 11.7	− 1 48.3	−0.4272	0.5899	+0.1032	+14	−49
				NEW	*MOON.*						
ζ Geminorum	4.0	+1.36	− 5.7	+20 42.9	**30** 15 50.4	−10 34.2	−0.8646	0.5643	−0.1014	−12	−69
f Geminorum	6.0	1.44	7.4	17 54.0	**31** 7 51.7	+ 4 54.3	+0.2869	0.5525	0.1285	+56	−12
g Geminorum	5.3	1.47	7.4	18 45.1	10 55.5	+ 7 52.0	−1.0262	0.5503	0.1332	−23	−71
1 Cancri	6.3	+1.49	− 8.4	+16 3.3	16 2.7	−11 11.0	+1.1661	0.5468	−0.1406	+90	+42
3 Cancri	6.0	1.51	8.2	17 34.8	17 48.3	− 9 28.9	−0.7225	0.5455	0.1431	− 2	−72
5 Cancri	6.3	+1.50	− 8.4	+16 43.7	18 9.5	− 9 8.3	+0.1426	0.5453	−0.1435	+46	−22

JUNE.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
29 Cancri	6.0	+1.59	− 9.8	+14 32.3	**1** 7 12.9	+ 3 30.0	+0.5198	0.5364	−0.1602	+72	− 4
A^1 Cancri	6.0	1.63	10.6	13 2.2	14 24.6	+10 28.2	+0.9686	0.5316	0.1681	+90	+23
60 Cancri	6.0	1.68	11.3	12 0.3	20 46.7	− 7 21.5	+1.0008	0.5280	0.1745	+90	+25
a^2 Cancri	4.0	+1.69	−11.3	+12 14.5	22 3.7	− 6 6.8	+0.5190	0.5277	−0.1757	+72	− 6
κ Cancri	5.1	1.72	11.9	11 4.0	**2** 2 46.5	− 1 32.5	+0.9618	0.5246	0.1798	+90	+20
ω Leonis	5.9	1.81	12.9	9 29.3	13 26.9	+ 8 48.8	+0.7252	0.5191	0.1881	+90	+ 4
h Leonis	5.7	1.83	12.8	10 9.2	15 16.0	+10 34.7	−0.3458	0.5182	0.1894	+19	−55
14 Sextantis	6.6	1.97	14.8	6 5.7	**3** 9 44.2	+ 4 31.0	+0.5143	0.5109	0.1994	+71	− 9
16 Sextantis	6.9	+1.99	−14.6	+ 6 39.4	11 2.8	+ 5 47.4	−0.3659	0.5105	−0.2000	+18	−59
19 Sextantis	6.2	2.01	15.2	5 6.3	12 58.5	+ 7 39.8	+0.9578	0.5099	0.2007	+90	+16
34 Sextantis	6.7	2.15	15.9	4 6.1	**4** 5 8.3	− 0 37.7	−1.2205	0.5063	0.2053	−37	−86
36 Sextantis	6.6	2.16	16.3	3 0.6	6 31.6	+ 0 43.4	−0.3028	0.5060	0.2055	+22	−55
55 Leonis	6.2	2.22	17.0	1 15.9	12 17.0	+ 6 19.1	+0.4425	0.5054	0.2062	+65	−14
57 Leonis	6.9	+2.22	−17.1	+ 0 57.7	12 33.3	+ 6 35.1	+0.7221	0.5054	−0.2063	+90	+ 1

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
p^2 Leonis	5.4	+2.26	−17.2	+ 0 32.0	4 16 37.6	+10 32.5	+0.3558	0.5051	−0.2066	+59	−19
p^4 Leonis	6.9	2.29	17.8	− 0 47.8	19 42.7	−10 27.5	+1.1881	0.5050	0.2067	+89	+34
p^5 Leonis	5.7	2.31	17.3	+ 0 28.2	22 11.1	− 8 3.2	−0.7233	0.5049	0.2067	− 1	−87
e Leonis	5.3	2.41	18.2	− 2 27.4	5 7 15.3	+ 0 46.0	+0.6383	0.5055	0.2061	+82	− 4
B. A. C. 4006	6.1	2.54	18.8	4 47.0	18 34.0	+11 45.8	+0.8931	0.5067	0.2039	+85	+11
q Virginis	5.7	+2.81	−19.3	− 8 54.4	6 17 33.8	+10 6.7	+0.8459	0.5129	−0.1947	+81	+ 9
χ Virginis	5.2	2.83	18.7	7 27.0	20 27.8	−11 4.3	−1.3201	0.5139	0.1931	−53	−90
ψ Virginis	5.2	2.93	18.7	9 0.1	7 4 23.9	− 3 22.0	−1.1243	0.5172	0.1881	−31	−90
g Virginis	5.9	3.02	18.5	10 12.6	11 25.4	+ 3 27.2	−1.0971	0.5205	0.1829	−30	−90
i Virginis	5.7	3.15	18.3	12 11.6	21 2.8	−11 12.5	−0.6444	0.5254	0.1746	− 1	−84
85 Virginis	6.5	+3.31	−18.2	−15 16.2	8 6 28.9	− 2 3.7	+1.1092	0.5308	−0.1652	+75	+29
B. A. C. 4700	5.6	3.46	16.8	15 50.1	18 51.6	+ 9 55.8	−0.2337	0.5384	0.1507	+18	−52
B. A. C. 4896	6.6	3.68	14.3	17 22.7	9 14 5.6	+ 4 32.3	−1.2035	0.5508	0.1234	−65	−90
10 Libræ	6.5	3.71	14.4	17 56.8	14 12.7	+ 4 39.2	−0.6050	0.5508	0.1231	− 6	−82
ι^1 Libræ	5.0	3.83	13.0	19 25.0	23 30.6	−10 21.6	−0.0990	0.5569	0.1077	+20	−44
ι^2 Libræ	6.5	+3.83	−12.9	−19 16.5	10 0 0.5	− 9 52.7	−0.3053	0.5572	−0.1069	+ 9	−57
B. A. C. 5109	6.2	3.91	11.3	19 20.0	8 39.0	− 1 32.1	−1.0998	0.5626	0.0913	−42	−90
λ Libræ	4.4	4.00	9.5	19 52.3	17 46.2	+ 7 15.9	−1.2716	0.5689	0.0736	−65	−90
δ Scorpii	2.6	4.09	9.2	22 20.4	20 45.4	+10 8.8	+1.1409	0.5696	0.0675	+68	+36
ω^1 Scorpii	4.6	4.05	8.3	20 24.1	23 35.3	−11 7.4	−1.0993	0.5711	0.0617	−44	−90
ω^2 Scorpii	4.6	+4.06	− 8.3	−20 36.1	23 50.4	−10 52.8	−0.9024	0.5712	−0.0613	−30	−90
B. A. C. 5395	7.0	4.10	7.7	21 8.8	11 2 32.1	− 8 17.0	−0.4811	0.5726	0.0556	− 6	−71
ω Ophiuchi	4.7	4.15	6.0	21 15.3	10 24.0	− 0 42.2	−0.7361	0.5763	0.0386	−23	−90
URANUS				21 55.5	13 31.2	+ 2 19.1	−0.1383	0.5794	0.0320	+10	−46
15 Ophiuchi	7.3	4.23	4.7	22 59.9	15 51.7	+ 4 33.5	+0.9237	0.5785	0.0265	+67	+17
22 Ophiuchi	6.7	+4.25	− 3.8	−23 21.0	19 55.7	+ 8 28.5	+1.2013	0.5802	−0.0174	+67	+45
24 Ophiuchi	5.9	4.25	3.6	22 59.5	20 45.1	+ 9 16.0	+0.8121	0.5803	0.0155	+67	+10
B. A. C. 5758	6.6	4.21	− 2.6	21 25.6	12 0 42.2	−10 55.6	−0.8736	0.5815	−0.0064	−34	−90
52 Ophiuchi	6.5	4.24	+ 0.4	21 58.6	12 45.6	+ 0 40.7	−0.2047	0.5843	+0.0216	+ 6	−51
B. A. C. 5954	6.8	4.24	0.8	21 51.2	14 11.1	+ 2 3.0	−0.2997	0.5843	0.0249	+ 1	−57
58 Ophiuchi	5.4	+4.23	+ 1.2	−21 38.1	16 7.4	+ 3 54.9	−0.4750	0.5842	+0.0294	− 9	−70
B. A. C. 6098	6.0	4.20	3.1	20 44.2	13 0 2.2	+11 31.7	−1.1000	0.5854	0.0479	−46	−90
Piazzi 17^h 334	5.3	4.26	3.3	22 50.3	0 32.2	−11 59.4	+1.1056	0.5854	0.0490	+67	+33
μ Sagittarii	4.1	4.20	4.3	21 5.0	4 36.9	− 8 3.9	−0.4944	0.5854	0.0584	− 7	−72
14 Sagittarii	6.0	4.22	4.3	21 44.3	4 48.5	− 7 52.8	+0.1950	0.5854	0.0589	+31	−27
15 Sagittarii	5.8	+4.19	+ 4.4	−20 45.4	5 13.0	− 7 29.1	−0.7974	0.5855	+0.0598	−24	−90
16 Sagittarii	6.6	4.18	4.4	20 25.0	5 13.5	− 7 28.7	−1.1490	0.5855	0.0599	−50	−90
SATURN				22 25.2	5 45.6	− 6 57.7	+0.9582	0.5886	0.0612	+68	+20
17 Sagittarii	7.0	4.18	4.5	20 34.6	5 47.1	− 6 56.3	−0.9497	0.5854	0.0612	−34	-90
21 Sagittarii	5.1	4.17	5.4	20 35.6	9 23.5	− 3 28.2	−0.6951	0.5853	0.0694	−17	−90
B. A. C. 6336	6.2	+4.17	+ 6.6	−21 28.7	14 32.9	+ 1 29.6	+0.6074	0.5848	+0.0810	+61	− 3
B. A. C. 6347	6.0	4.16	6.6	21 8.0	14 57.8	+ 1 53.6	+0.2839	0.5846	0.0821	+38	−22
B. A. C. 6386	7.3	4.13	7.5	20 20.9	18 40.8	+ 5 28.2	−0.1711	0.5843	0.0902	+14	−48
29 Sagittarii	5.5	4.12	7.7	20 26.2	19 25.3	+ 6 11.0	−0.0466	0.5841	0.0918	+21	−41
33 Sagittarii	6.0	4.13	8.2	21 28.8	21 11.7	+ 7 53.4	+1.1926	0.5838	0.0957	+69	+42
ξ^1 Sagittarii	5.7	+4.10	+ 8.4	−20 47.1	22 35.4	+ 9 13.9	+0.6137	0.5836	+0.0987	+62	− 3
ξ^2 Sagittarii	3.5	4.13	8.5	21 14.1	22 44.4	+ 9 22.5	+1.0922	0.5835	0.0990	+69	+31
Lalande 35497	6.4	4.06	8.8	19 23.3	14 0 59.1	+11 32.3	−0.5807	0.5831	0.1038	− 7	−79
B. A. C. 6536	5.8	4.05	9.3	19 26.7	3 8.9	−10 22.8	−0.2928	0.5827	0.1083	+ 9	−56
d Sagittarii	5.0	4.02	10.1	19 7.7	7 2.7	− 6 37.7	−0.1791	0.5817	0.1164	+16	−49
ρ^1 Sagittarii	4.2	+3.97	+10.2	−18 2.0	8 44.8	− 4 59.5	−1.1010	0.5813	+0.1199	−40	−90
ρ^2 Sagittarii	6.5	3.99	10.3	18 29.4	8 48.5	− 4 55.9	−0.6243	0.5813	0.1200	− 8	−84
B. A. C. 6658	7.3	3.97	10.9	18 33.5	11 25.0	− 2 25.2	−0.2350	0.5806	0.1252	+14	−52
B. A. C. 6707	6.4	3.95	11.7	19 4.2	14 54.3	+ 0 56.3	+0.7380	0.5796	0.1321	+72	+ 4
B. A. C. 6710	5.8	3.94	11.6	18 27.0	15 10.6	+ 1 12.0	+0.1398	0.5775	0.1326	+35	−30
B. A. C. 6992	6.7	+3.69	+14.3	−15 5.8	15 9 45.9	− 4 53.6	−0.5051	0.5731	+0.1653	+ 4	−71

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
β Capricorni	3.2	+3.69	+14.3	−15 5.6	**15** 9 52.0	− 4 47.7	−0.4916	0.5731	+0.1655	+ 5	−70
B. A. C. 7087	6.3	3.62	14 9	14 3.6	15 32.9	+ 0 41.0	−0.5767	0.5710	0.1743	+ 1	−77
τ^1 Capricorni	7.0	3.62	15.4	15 29.4	16 53.8	+ 1 59.0	+1.1131	0.5705	0.1763	+75	+29
τ^2 Capricorni	5.6	3.61	15.5	15 18.1	17 43.9	+ 2 47.2	+1.0694	0.5702	0.1775	+75	+26
8 Aquarii	6.8	3.49	16.3	13 26.2	**16** 2 44.6	+11 28.7	+0.8277	0.5669	0.1896	+77	+ 8
ν Aquarii	4.7	+3.42	+16.3	−11 46.3	7 0.3	− 8 24.6	−0.0428	0.5653	+0.1947	+32	−40
B. A. C. 7408	6.9	3.32	16.4	9 44.9	12 29.6	− 3 6.9	−1.0098	0.5635	0.2008	−23	−90
17 Aquarii	6.2	3.32	16.4	9 44.5	12 55.2	− 2 42.3	−0.9310	0.5634	0.2013	−15	−90
19 Aquarii	5.8	3.31	16.5	10 10.2	13 55.5	− 1 44.0	−0.2936	0.5630	0.2023	+19	−55
ξ Aquarii	4.8	3.23	16.6	8 17.9	19 30.7	+ 3 39.5	−1.0443	0.5612	0.2076	−24	−90
B. A. C. 7562	5.5	+3.21	+16.2	− 9 29.5	22 42.3	+ 6 43.4	+0.8314	0.5603	+0.2104	+81	+ 8
c^1 Capricorni	5.5	3.20	16.2	9 32.2	22 44.5	+ 6 46.5	+0.8858	0.5603	0.2104	+80	+11
c^2 Capricorni	6.4	3.20	16.5	9 44.0	23 18.4	+ 7 19.3	+1.2036	0.5602	0.2109	+80	+36
30 Aquarii	5.8	3.08	17.0	9 0.1	**17** 6 58.0	− 9 16.9	+0.0751	0.5581	0.2165	+41	−34
B. A. C. 7744	6.7	3.02	16.7	5 12.5	11 15.1	− 5 8.6	−0.8062	0.5571	0.2191	− 7	−90
B. A. C. 7752	6.7	+3.02	+16.7	− 4 56.5	11 45.8	− 4 39.0	−0.9620	0.5570	+0.2195	−17	−90
51 Aquarii	5.8	2.96	17.0	5 20.3	16 24.0	− 0 10.2	+0.4619	0.5561	0.2218	+66	−13
κ Aquarii	5.2	2.88	17.1	4 44.3	22 36.3	+ 5 49.4	+1.2396	0.5551	0.2242	+85	+39
Lalande 44337	6.3	2.86	16.9	4 4.1	23 59.1	+ 7 9.4	+0.8708	0.5549	0.2246	+86	+10
3 Piscium	6.4	2.74	15.9	− 0 20.8	**18** 9 2.6	− 8 5.5	−0.8484	0.5541	0.2264	− 8	−90
κ Piscium	4.7	+2.61	+15.8	+ 0 42.7	21 2.9	+ 3 30.5	+0.8009	0.5538	+0.2261	+90	+ 4
9 Piscium	6.6	2.60	15.7	0 34.6	21 11.6	+ 3 48.9	+0.9730	0.5539	0.2261	+90	+17
16 Piscium	5.8	2.55	15.3	1 33.1	**19** 1 22.3	+ 7 41.1	+0.9282	0.5539	0.2253	+90	+14
19 Piscium	4.9	2.50	14.8	2 56.2	5 55.5	−11 54.9	+0.5507	0.5544	0.2239	+74	− 8
36 Piscium	6.3	2.37	12.7	7 41.3	19 36.4	+ 1 18.1	−1.2351	0.5565	0.2174	−41	−82
d Piscium	5.3	+2.35	+12.7	+ 7 38.3	21 25.3	+ 3 3.3	−0.7909	0.5569	+0.2163	− 5	−82
45 Piscium	6.9	2.32	12.7	7 8.5	23 43.1	+ 5 16.4	+0.2068	0.5573	0.2147	+50	−25
101 Piscium	6.3	2.05	8.7	14 9.2	**21** 6 44.1	+11 12.6	−0.6906	0.5668	0.1833	0	−76
104 Piscium	7.5	2.04	8.7	13 46.8	8 14.9	−11 19.8	−0.0368	0.5674	0.1809	+36	−35
27 Arietis	6.3	1.90	5.9	17 15.8	**22** 6 20.9	+ 9 58.2	+0.0410	0.5755	0.1459	+40	−26
B. A. C. 782	7.0	+1.88	+ 5.5	+18 26.4	7 28.4	+11 3.3	−0.9994	0.5760	+0.1439	−21	−72
36 Arietis	6.5	1.83	5.4	17 20.5	11 59.9	− 8 35.1	+0.7561	0.5775	0.1356	+90	+14
40 Arietis	6.3	1.82	5.1	17 52.1	13 45.6	− 6 53.3	+0.4536	0.5781	0.1322	+68	− 3
ρ^2 Arietis	6.0	1.79	4.8	17 55.7	16 48.3	− 3 57.4	+0.7873	0.5792	0.1264	+90	+17
ρ^3 Arietis	6.0	1.80	4.8	17 37.6	17 3.5	− 3 42.8	+1.1285	0.5792	0.1259	+90	+41
54 Arietis	6.3	+1.76	+ 4.2	+18 24.8	22 1.5	+ 1 4.1	+0.9242	0.5807	+0.1160	+90	+27
δ Arietis	4.0	1.77	3.8	19 21.0	23 22.2	+ 2 21.8	+0.1172	0.5815	0.1132	+45	−19
ζ Arietis	4.8	1.77	3.4	20 40.5	**23** 0 43.1	+ 3 39.6	−1.0923	0.5816	0.1105	−30	−69
τ^1 Arietis	5.0	1.75	3.1	20 47.2	3 20.0	+ 6 10.6	−0.9266	0.5822	0.1050	−17	−69
τ^2 Arietis	5.3	1.74	3.1	20 23.1	3 58.5	+ 6 47.8	−0.4468	0.5823	0.1036	+13	−51
65 Arietis	6.0	+1.73	+ 3.1	+20 27.0	4 40.0	+ 7 27.7	−0.4429	0.5831	+0.1022	+13	−50
B. A. C. 1143	6.0	1.68	2.2	20 36.8	12 55.2	− 8 35.7	+0.1589	0.5843	0.0843	+47	−14
B. A. C. 1189	6.0	1.68	1.7	21 56.5	15 8.4	− 6 27.5	−1.0277	0.5847	0.0793	−26	−68
32 Tauri	6.0	1.67	1.4	22 11.4	17 59.1	− 3 43.3	−1.0684	0.5851	0.0730	−29	−68
A^1 Tauri	4.6	1.66	1.1	21 48.5	21 12.0	− 0 37.7	−0.4524	0.5855	0.0657	+13	−48
A^2 Tauri	6.3	+1.66	+ 1.1	+21 44.4	21 27.6	− 0 22.7	−0.3640	0.5855	+0.0651	+18	−42
51 Tauri	6.0	1.61	0.7	21 20.1	**24** 2 48.9	+ 4 46.4	+0.3697	0.5859	0.0525	+62	0
53 Tauri	6.0	1.60	0.7	20 54.0	3 15.2	+ 5 11.8	+0.8423	0.5859	0.0517	+90	+27
56 Tauri	6.0	1.61	0.6	21 31.9	3 19.0	+ 5 15.4	+0.1923	0.5860	0.0516	+50	−10
χ^1 Tauri	4.7	1.61	0.3	22 3.9	5 39.6	+ 7 30.7	−0.2451	0.5861	0.0462	+24	−33
χ^2 Tauri	6.3	+1.61	+ 0.3	+21 58.3	5 40.9	+ 7 31.9	−0.1470	0.5861	+0.0461	+30	−27
				NEW	*MOON.*						
f Geminorum	6.0	+1.45	− 7.2	+17 54.0	**27** 16 28.8	− 8 40.8	+0.3228	0.5545	−0.1284	+58	−11
g Geminorum	5.3	1.45	7.5	18 45.1	19 32.0	− 5 43.7	−0.9892	0.5524	0.1323	−21	−71
1 Cancri	6.3	+1.46	− 8.0	+16 3.3	**28** 0 37.9	− 0 48.0	+1.2062	0.5492	−0.1407	+90	+57

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0		Apparent Declination.	Washington Mean Time.	Hour Angle. *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
3 Cancri	6.0	+1.48	− 7.9	+17 34.8	28 2 23.0	+ 0 53.6	−0.6811	0.5481	−0.1433	0	−71
5 Cancri	6.3	1.44	8.1	16 43.7	2 44.1	+ 1 40.0	+0.1792	0.5479	0.1436	+49	−19
29 Cancri	6.0	1.50	9.2	14 32.4	15 42.7	−10 12.4	+0.5684	0.5396	0.1606	+77	− 1
A¹ Cancri	6.0	1.53	9.8	13 2.2	22 51.2	− 3 17.4	+1.0207	0.5351	0.1686	+90	+26
A² Cancri	6.0	1.52	10.1	12 28.4	29 0 42.2	− 1 29.9	+1.3175	0.5341	0.1706	+90	+60
60 Cancri	6.0	+1.55	−10.4	+12 0.3	5 10.3	+ 2 49.9	+1.0562	0.5314	−0.1751	+90	+28
*a*² Cancri	4.0	1.56	10.4	12 14.5	6 26.8	+ 4 4.2	+0.5754	0.5308	0.1763	+77	− 2
κ Cancri	5.1	1.57	11.0	11 4.1	11 7.1	+ 8 35.9	+1.0205	0.5280	0.1805	+90	+24
ω Leonis	5.9	1.63	11.7	9 29.3	21 42.0	− 5 8.2	+0.7902	0.5225	0.1888	+90	+ 8
k Leonis	5.7	1.64	11.6	10 9.2	23 30.2	− 3 23.2	−0.2777	0.5216	0.1901	+23	−51
14 Sextantis	6.6	+1.75	−13.3	+ 6 5.7	30 17 49.5	− 9 36.0	+0.5903	0.5138	−0.2001	+77	− 5
16 Sextantis	6.9	1.76	13.2	6 39.4	19 7.6	− 8 20.1	−0.2880	0.5133	0.2006	+22	−53
19 Sextantis	6.2	+1.77	−13.7	+ 5 6.3	21 2.6	− 6 28.3	+1.0340	0.5127	−0.2014	+90	+22

JULY.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle. *H*	*Y*	*x′*	*y′*	N.	S.
34 Sextantis	6.7	+1.90	−14.2	+ 4 6.1	1 13 6.5	+ 9 8.3	−1.1346	0.5083	−0.2057	−29	−86
36 Sextantis	6.6	1.90	14.5	3 0.6	14 29.2	+10 28.8	−0.2136	0.5080	0.2060	+27	−50
55 Leonis	6.2	1.95	15.2	1 15.9	20 13.6	− 7 56.5	+0.5286	0.5070	0.2066	+72	−10
57 Leonis	6.9	+1.95	−15.2	+ 0 57.7	20 29.5	− 7 40.9	+0.8090	0.5070	−0.2066	+90	+ 4
*p*² Leonis	5.4	1.99	15.4	+ 0 32.0	2 0 32.9	− 3 44.4	+0.4448	0.5063	0.2068	+65	−14
*p*⁴ Leonis	6.9	2.02	15.9	− 0 47.7	3 37.4	− 0 45.6	+1.2771	0.5061	0.2069	+89	+53
*p*⁵ Leonis	5.7	2.04	15.5	+ 0 28.2	6 5.6	+ 1 39.1	−0.6324	0.5059	0.2068	+ 4	−81
e Leonis	5.3	2.13	16.4	− 2 27.4	15 9.1	+10 27.5	+0.7350	0.5056	0.2060	+85	+ 2
B. A. C. 4006	6.1	+2.25	−17.0	− 4 46.9	3 2 28.4	− 2 32.0	+0.9895	0.5061	−0.2036	+85	+18
q Virginis	5.7	2.53	17.7	8 54.3	4 1 34.1	− 4 5.2	+0.9448	0.5109	0.1940	+81	+15
χ Virginis	5.2	2.56	17.0	7 27.0	4 29.4	− 1 15.0	−1.2265	0.5117	0.1923	−40	−90
ψ Virginis	5.2	2.67	17.1	9 0.0	12 29.1	+ 6 31.0	−1.0314	0.5146	0.1871	−24	−90
g Virginis	5.9	2.76	17.0	10 12.6	19 34.3	−10 36.2	−1.0054	0.5174	0.1819	−23	−90
i Virginis	5.7	+2.90	−17.0	−12 11.5	5 5 17.3	− 1 10.3	−0.5536	0.5222	−0.1736	+ 4	−75
85 Virginis	6.5	3.05	17.1	15 16.2	14 49.5	+ 8 4.6	+1.2062	0.5281	0.1642	+75	+39
B. A. C. 4700	5.6	3.26	15.9	15 50.0	6 3 20.7	− 3 47.3	−0.1490	0.5342	0.1499	+22	−47
B. A. C. 4896	6.6	3.54	13.6	17 22.7	22 48.0	− 8 57.4	−1.1307	0.5467	0.1229	−41	−90
10 Libræ	6.5	3.56	13.8	17 56.8	22 55.2	− 8 50.3	−0.5314	0.5467	0.1226	− 1	−74
ι¹ Libræ	5.0	+3.72	−12.7	−19 25.0	7 8 18.8	+ 0 14.5	−0.0293	0.5530	−0.1076	+24	−40
ι² Libræ	6.5	3.72	12.5	19 16.5	8 49.1	+ 0 43.7	−0.2366	0.5533	0.1067	+12	−52
B. A. C. 5109	6.2	3.85	10.9	19 20.0	17 32.4	+ 9 9.2	−1.0365	0.5590	0.0913	−36	−90
λ Libræ	4.4	3.96	9.2	19 52.2	8 2 43.9	− 5 58.5	−1.2157	0.5648	0.0739	−56	−90
δ Scorpii	2.6	4.07	9.2	22 20.4	5 44.3	− 3 4.4	+1.1965	0.5667	0.0679	+68	+43
ω¹ Scorpii	4.6	+4.04	− 8.1	−20 24.1	8 35.1	− 0 19.7	−1.0474	0.5684	−0.0622	−44	−90
ω² Scorpii	4.6	4.06	8.1	20 36.4	8 50.4	− 0 4.8	−0.8506	0.5686	0.0617	−27	−90
B. A. C. 5395	7.0	4.10	7.6	21 8.8	11 32.9	+ 2 31.8	−0.4311	0.5702	0.0561	− 3	−66
ω Ophiuchi	4.7	4.20	5.9	21 15.2	19 26.6	+10 8.4	−0.6920	0.5745	0.0393	−19	−90
URANUS				21 47.0	20 48.1	+11 26.8	−0.1853	0.5766	0.0366	+ 8	−50
15 Ophiuchi	7.3	+4.31	− 4.9	−22 59.9	9 0 55.0	− 8 35.2	+0.9620	0.5771	−0.0273	+67	+20
24 Ophiuchi	5.9	4.35	3.7	22 59.5	5 48.6	− 3 52.5	+0.8455	0.5794	0.0163	+67	+12
B. A. C. 5758	6.6	4.33	− 2.4	21 25.6	9 45.5	− 0 4.4	−0.8400	0.5811	−0.0073	−31	−90
52 Ophiuchi	6.5	4.44	+ 0.6	21 58.6	21 46.7	+11 29.7	−0.1840	0.5852	+0.0207	+ 5	−49
B. A. C. 5954	6.8	4.44	1.0	21 51.2	23 11.7	−11 8.5	−0.2800	0.5856	0.0240	+ 2	−55
58 Ophiuchi	5.4	+4.44	+ 1.5	−21 38.1	10 1 7.4	− 9 17.1	−0.4564	0.5870	+0.0285	− 7	−69
B. A. C. 6098	6.0	4.46	3.7	20 44.2	8 58.7	− 1 43.8	−1.0854	0.5874	0.0470	−45	−90
Piazzi 17ʰ 334	5.3	4.53	3.6	22 50.3	9 28.4	− 1 15.2	+1.1085	0.5877	0.0482	+67	+33
SATURN				22 28.9	11 11.0	+ 0 23.4	+0.8295	0.5936	0.0526	+68	+12
μ Sagittarii	4.1	4.48	4.8	21 5.0	13 30.7	+ 2 37.8	−0.4876	0.5882	0.0577	− 7	−71
14 Sagittarii	6.0	+4.50	+ 4.8	−21 44.3	13 42.2	+ 2 48.9	+0.1977	0.5882	+0.0582	+31	−27

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0. Δα	Red'ns from 1900.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	"	° ′	d h m	h m				°	°
15 Sagittarii	5.8	+4.48	+ 5.1	−20 45.4	10 14 6.6	+ 3 12.4	−0.7892	0.5882	+0.0591	−24	−90
16 Sagittarii	6.6	4.46	5.1	20 25.0	14 7.0	+ 3 12.7	−1.1390	0.5882	0.0591	−49	−90
17 Sagittarii	7.0	4.47	5.2	20 34.6	14 40.3	+ 3 44.8	−0.9413	0.5883	0.0604	−33	−90
21 Sagittarii	5.1	4.48	6.1	20 35.6	18 14.2	+ 7 10.5	−0.6917	0.5886	0.0687	−17	−90
B. A. C. 6336	6.2	4.52	7.3	21 28.7	23 19.7	−11 55.7	+0.5969	0.5887	0.0805	+59	− 4
B. A. C. 6347	6.0	+4.51	+ 7.4	−21 8.0	23 44.3	−11 32.0	+0.2752	0.5887	+0.0814	+38	−22
29 Sagittarii	5.5	4.49	8.6	20 26.2	11 4 8.0	− 7 18.4	−0.0579	0.5886	0.0914	+20	−41
33 Sagittarii	6.0	4.53	9.0	21 28.8	5 52.7	− 5 37.7	+1.1708	0.5884	0.0953	+69	+39
ξ¹ Sagittarii	5.7	4.49	9.4	20 47.1	7 15.1	− 4 18.5	+0.5938	0.5883	0.0984	+61	− 5
ξ² Sagittarii	3.5	4.52	9.4	21 14.1	7 24.0	− 4 10.0	+1.0684	0.5883	0.0987	+69	+29
Lalande 35497	6.4	+4.46	+10.0	−19 23.3	9 36.5	− 2 2.5	−0.5937	0.5881	+0.1036	−11	−81
B. A. C. 6536	5.8	4.47	10.5	19 26.6	11 44.1	+ 0 0.2	−0.3105	0.5878	0.1082	+ 8	−57
d Sagittarii	5.0	4.45	11.5	19 7.8	15 33.8	+ 3 41.2	−0.2019	0.5874	0.1164	+15	−50
ρ¹ Sagittarii	4.2	4.41	11.9	18 1.9	17 14.0	+ 5 17.5	−1.1176	0.5871	0.1200	−41	−90
ρ² Sagittarii	6.5	4.43	11.8	18 29.4	17 17.5	+ 5 20.9	−0.6453	0.5871	0.1201	− 9	−87
B. A. C. 6658	7.3	+4.43	+12.5	−18 33.5	19 51.0	+ 7 48.6	−0.2623	0.5866	+0.1254	+12	−54
B. A. C. 6707	6.4	4.43	13.3	19 4.2	23 16.2	+11 6.0	+0.6978	0.5859	0.1324	+70	+ 1
B. A. C. 6710	5.8	4.41	13.3	18 27.0	23 32.1	+11 21.3	+0.1048	0.5859	0.1329	+34	−32
B. A. C. 6992	6.7	4.25	16.9	15 5.7	12 17 42.2	+ 4 50.4	−0.5543	0.5809	0.1665	+ 1	−76
β Capricorni	3.2	4.25	16.9	15 5.6	17 48.1	+ 4 56.1	−0.5408	0.5809	0.1666	+ 2	−74
B. A. C. 7087	6.3	+4.20	+17.9	−14 3.6	23 20.4	+10 16.1	−0.6315	0.5791	+0.1756	− 2	−83
τ¹ Capricorni	7.0	4.22	18.2	15 29.4	13 0 39.2	+11 32.1	+1.0374	0.5787	0.1776	+75	+23
τ² Capricorni	5.6	4.21	18.3	15 18.0	1 28.1	−11 40.9	+0.9934	0.5784	0.1789	+75	+20
8 Aquarii	6.8	4.12	19.5	13 26.1	10 14.5	− 3 13.7	+0.7439	0.5754	0.1913	+75	+ 3
ν Aquarii	4.7	4.06	19.9	11 46.3	14 23.4	+ 0 46.2	−0.1208	0.5740	0.1966	+27	−45
B. A. C. 7408	6.9	+3.98	+20.3	− 9 44.8	19 43.7	+ 5 54.8	−1.0821	0.5722	+0.2028	−28	−90
17 Aquarii	6.2	3.98	20.3	9 44.4	20 8.6	+ 6 18.8	−1.0046	0.5722	0.2033	−22	−90
19 Aquarii	5.8	3.98	20.4	10 10.1	21 7.2	+ 7 15.4	−0.3763	0.5717	0.2043	+15	−61
ξ Aquarii	4.8	3.91	20.8	8 17.8	14 2 33.3	−11 30.3	−1.1234	0.5700	0.2098	−31	−90
B. A. C. 7562	5.5	3.90	21.4	9 29.4	5 39.7	− 8 30.6	+0.7271	0.5688	0.2127	+80	+ 2
*c*¹ Capricorni	5.5	+3.90	+21.4	− 9 32.2	5 41.8	− 8 28.6	+0.7800	0.5688	+0.2127	+80	+ 5
*c*² Capricorni	6.4	3.89	21.5	9 43.9	6 14.7	− 7 56.8	+1.0926	0.5688	0.2132	+80	+26
30 Aquarii	5.8	3.80	21.6	7 0.0	13 41.9	− 0 45.4	−0.0294	0.5667	0.2189	+34	−39
B. A. C. 7744	6.7	3.75	21.5	5 12.5	17 52.3	+ 3 16.1	−0.9026	0.5654	0.2215	−12	−90
B. A. C. 7752	6.7	3.74	21.5	4 56.5	18 22.1	+ 3 44.8	−1.0588	0.5653	0.2218	−24	−90
51 Aquarii	5.8	+3.69	+21.9	− 5 20.2	22 53.1	+ 8 6.4	+0.3447	0.5642	+0.2242	+58	−20
κ Aquarii	5.2	3.64	22.0	4 44.3	15 4 56.0	−10 3.4	+1.1088	0.5629	0.2269	+85	+27
Lalande 44337	6.3	3.62	21.9	4 4.0	6 16.8	− 8 45.4	+0.7434	0.5626	0.2270	+83	+ 2
3 Piscium	6.4	3.52	21.3	− 0 20.7	15 7.5	− 0 13.1	−0.9649	0.5611	0.2286	−16	−90
κ Piscium	4.7	3.40	21.0	+ 0 42.8	16 2 52.6	+11 7.6	+0.6609	0.5599	0.2280	+84	− 1
9 Piscium	6.6	+3.40	+21.1	+ 0 34.7	3 1.2	+11 15.9	+0.8290	0.5599	+0.2280	+90	+ 7
16 Piscium	5.8	3.36	20.8	1 33.2	7 7.2	− 8 46.6	+0.7856	0.5597	0.2265	+90	+ 5
19 Piscium	4.9	3.32	20.3	2 56.3	11 35.7	− 4 27.4	+0.4097	0.5596	0.2256	+63	−16
d Piscium	5.3	3.19	18.3	7 38.4	17 2 52.6	+10 17.9	−0.9279	0.5602	0.2173	−14	−82
45 Piscium	6.9	3.17	18.3	7 8.6	5 8.8	−11 30.6	+0.0635	0.5604	0.2157	+42	−33
101 Piscium	6.3	+2.92	+13.5	+14 9.2	18 12 1.4	− 5 42.8	−0.8312	0.5660	+0.1829	− 9	−76
104 Piscium	7.5	2.91	13.5	13 46.9	13 32.4	− 4 15.1	−0.1773	0.5664	0.1808	+28	−42
27 Arietis	6.3	2.72	9.9	17 15.9	19 11 46.0	− 6 49.4	−0.0901	0.5722	0.1455	+33	−33
B. A. C. 782	7.0	2.73	9.4	18 26.5	12 54.1	− 5 43.7	−1.1330	0.5725	0.1436	−32	−72
36 Arietis	6.5	2.67	9.1	17 20.6	17 28.5	− 1 19.2	+0.6304	0.5736	0.1352	+84	+ 6
40 Arietis	6.3	+2.67	+ 8.7	+17 52.2	19 15.5	+ 0 23.9	+0.3289	0.5741	+0.1319	+58	−10
π Arietis	5.7	2.66	9.0	17 3.1	19 35.4	+ 0 43.0	+1.2137	0.5741	0.1313	+90	+49
ρ¹ Arietis	7.0	2.64	8.6	17 20.8	21 58.1	+ 3 0.5	+1.2174	0.5747	0.1268	+90	+51
ρ² Arietis	6.0	2.64	8.3	17 55.7	22 20.3	+ 3 21.9	+0.6659	0.5747	0.1260	+89	+10
ρ³ Arietis	6.0	2.64	8.3	17 37.6	22 35.7	+ 3 36.7	+1.0087	0.5748	0.1256	+90	+31
54 Arietis	6.3	+2.59	+ 7.5	+18 24.8	20 3 37.5	+ 8 27.5	+0.8075	0.5759	+0.1157	+90	+19

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0. Δα	Red'ns from 1900.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x'*	*y'*	N.	S.
		s	"	° '	d h m	h m				°	°
δ Arietis	4.0	+2.60	+ 6.9	+19 21.0	20 4 59.3	+ 9 46.3	−0.0022	0.5763	+0.1130	+38	−25
τ¹ Arietis	5.0	2.58	6.0	20 47.3	9 0.7	−10 21.2	−1.0462	0.5769	0.1047	−26	−69
τ² Arietis	5.3	2.56	6.0	20 23.2	9 39.7	− 9 43.6	−0.5653	0.5771	0.1035	+ 6	−59
65 Arietis	6.0	2.55	6.0	20 27.1	10 21.8	− 9 3.1	−0.5611	0.5772	0.1020	+ 6	−59
B. A. C. 1143	6.0	2.48	4.8	20 36.9	18 44.9	− 0 58.4	+0.0533	0.5786	0.0843	+41	−20
B. A. C. 1189	6.0	+2.48	+ 4.0	+21 56.5	21 0.3	+ 1 11.8	−1.1406	0.5789	+0.0794	−36	−68
32 Tauri	6.0	2.46	3.5	22 11.5	23 54.0	+ 3 59.0	−1.1791	0.5792	0.0731	−41	−68
A¹ Tauri	4.6	2.42	3.2	21 48.6	21 3 10.2	+ 7 7.9	−0.5563	0.5795	0.0658	+ 6	−55
A² Tauri	6.3	2.42	3.2	21 44.4	3 26.1	+ 7 23.3	−0.4670	0.5795	0.0653	+11	−49
51 Tauri	6.0	2.35	2.6	21 20.1	8 53.2	−11 21.8	+0.2769	0.5798	0.0532	+55	− 5
53 Tauri	6.0	+2.34	+ 2.7	+20 54.1	9 20.0	−10 56.0	+0.7531	0.5798	+0.0522	+90	+22
56 Tauri	6.0	2.35	2.5	21 31.9	9 23.8	−10 52.4	+0.0987	0.5798	0.0520	+44	−14
χ¹ Tauri	4.7	2.34	2.0	22 3.9	11 47.0	− 8 34.5	−0.3392	0.5798	0.0467	+19	−39
χ² Tauri	6.3	2.34	2.0	21 58.3	11 48.3	− 8 33.3	−0.2404	0.5798	0.0466	+24	−33
υ¹ Tauri	4.7	2.35	1.8	22 35.2	12 10.0	− 8 12.3	−0.8656	0.5799	0.0458	−13	−67
υ² Tauri	6.0	+2.35	+ 1.7	+22 46.3	12 34.7	− 7 48.5	−1.0390	0.5798	+0.0449	−26	−67
B. A. C. 1373	6.0	2.32	2.0	21 23.8	12 53.9	− 7 30.1	+0.4094	0.5798	0.0441	+65	+ 3
τ Tauri	4.5	2.29	+ 1.2	22 45.9	18 48.9	− 1 48.2	−0.7991	0.5797	0.0308	− 9	−67
ι Tauri	5.0	2.19	0.0	21 26.8	22 3 33.3	+ 6 36.8	+0.7634	0.5789	0.0109	+90	+26
105 Tauri	6.0	2.17	− 0.3	21 34.3	5 34.8	+ 8 33.8	+0.6499	0.5786	+0.0063	+89	+20
Mars				+22 56.4	7 49.3	+10 43.3	−0.7787	0.5483	−0.0021	− 7	−67
108 Tauri	6.3	+2.15	− 0.8	22 10.2	8 44.2	+11 36.2	+0.0305	0.5780	0.0009	+40	−13
n Tauri	5.7	2.14	1.0	21 59.6	10 20.6	−10 51.2	+0.2130	0.5775	0.0045	+51	− 4
o Tauri	6.0	2.11	1.4	21 51.1	13 52.2	− 7 27.1	+0.3326	0.5770	0.0124	+61	+ 2
ζ Tauri	3.3	2.06	1.8	21 4.9	18 7.2	− 3 21.5	+1.0725	0.5760	0.0219	+90	+46
B. A. C. 1801	6.0	+2.08	− 2.5	+23 9.4	20 29.3	− 1 4.7	−1.1774	0.5754	−0.0271	−41	−67
Neptune				22 14.4	23 2 27.1	+ 4 40.1	−0.4088	0.5721	0.0402	+15	−42
140 Tauri	7.0	2.02	3.3	22 53.6	3 48.7	+ 5 58.8	−1.1578	0.5731	0.0431	−39	−67
141 Tauri	6.7	2.01	3.3	22 23.8	4 20.7	+ 6 29.6	−0.6560	0.5730	0.0442	0	−62
η Geminorum	3.5	1.97	3.9	22 32.1	10 1.4	+11 58.1	−1.0892	0.5709	0.0563	−31	−67
14 Geminorum	7.2	+1.93	− 4.3	+21 41.9	14 44.2	− 7 29.2	−0.4913	0.5690	−0.0660	+10	−51
15 Geminor.([illegible])	7.0	1.91	4.3	20 51.0	15 39.2	− 6 36.1	+0.3500	0.5686	0.0678	+60	− 2
16 Geminorum	6.8	1.91	4.2	20 33.3	15 43.9	− 6 31.6	+0.6599	0.5686	0.0680	+90	+15
ν Geminorum	4.2	+1.90	− 4.2	+20 16.5	16 10.8	− 6 5.6	+0.9261	0.5684	−0.0690	+90	+32
				NEW	*MOON.*						
11 Sextantis	6.0	+1.67	−11.6	+ 8 47.3	27 20 43.1	− 4 46.6	−1.3228	0.5176	−0.1976	−52	−81
π Leonis	5.0	1.68	11.7	8 31.2	21 49.5	− 3 42.1	−1.2480	0.5172	0.1979	−41	−81
14 Sextantis	6.6	1.68	12.1	6 5.8	28 1 19.7	− 0 18.1	+0.7277	0.5158	0.1999	+90	+ 2
16 Sextantis	6.9	1.69	12.0	6 39.5	2 37.5	+ 0 57.5	−0.1547	0.5155	0.2001	+29	−46
19 Sextantis	6.2	1.68	12.3	5 6.3	4 32.0	+ 2 48.7	+1.1720	0.5149	0.2007	+90	+33
34 Sextantis	6.7	+1.76	−12.9	+ 4 6.1	20 32.7	− 5 37.8	−0.9777	0.5105	−0.2053	−17	−86
36 Sextantis	6.6	1.76	13.1	3 0.6	21 55.1	− 4 17.7	−0.0540	0.5102	0.2056	+35	−39
55 Leonis	6.2	1.80	13.5	1 16.0	29 3 38.3	+ 1 15.9	+0.6964	0.5091	0.2063	+89	0
57 Leonis	6.9	1.79	13.6	0 57.7	3 54.2	+ 1 31.4	+0.9780	0.5091	0.2063	+90	+17
*p*² Leonis	5.4	1.81	13.7	0 32.0	7 56.8	+ 5 27.2	+0.6179	0.5084	0.2065	+80	− 5
*p*⁵ Leonis	5.7	+1.85	−13.8	+ 0 28.2	13 28.7	+10 49.9	−0.4547	0.5077	−0.2065	+14	−68
e Leonis	5.3	1.92	14.5	− 2 27.3	22 31.2	− 4 22.7	+0.9241	0.5071	0.2056	+88	+14
B. A. C. 4006	6.1	2.01	15.0	4 46.9	30 9 50.0	+ 6 37.2	+1.1902	0.5074	0.2031	+85	+34
q Virginis	5.7	2.24	15.6	8 54.3	31 8 59.2	+ 5 7.6	+1.1617	0.5104	0.1932	+81	+32
χ Virginis	5.2	2.27	15.0	7 27.0	11 55.3	+ 7 58.7	−1.0159	0.5111	0.1915	−24	−90
ψ Virginis	5.2	+2.36	−15.1	− 9 0.0	19 58.1	− 8 12.3	−0.8178	0.5133	−0.1862	−10	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
g Virginis	5.9	+2.45	-15.1	-10 12.6	1 3 6.8	- 1 16.0	-0.7904	0.5156	-0.1809	- 9	-90
i Virginis	5.7	2.59	15.3	12 11.5	12 55.6	+ 8 15.7	-0.3355	0.5193	0.1726	+16	-58
B. A. C. 4700	5.8	2.93	14.3	15 50.0	2 11 16.9	+ 5 56.7	+0.0680	0.5299	0.1488	+34	-34
B. A. C. 4896	6.6	3.23	12.4	17 22.7	3 7 4.6	+ 1 7.1	-0.9310	0.5411	0.1220	-26	-90
10 Libræ	6.5	3.24	12.6	17 56.8	7 11.9	+ 1 14.2	-0.3265	0.5412	0.1218	+10	-58
ι^1 Libræ	5.0	+3.41	-11.7	-19 25.0	16 46.6	+10 30.2	+0.1728	0.5469	-0.1069	+35	-28
ι^2 Libræ	6.5	3.41	11.5	19 16.5	17 17.5	+11 0.0	-0.0365	0.5473	0.1061	+23	-40
B. A. C. 5109	6.2	3.55	10.1	19 20.0	4 2 11.2	- 4 24.1	-0.8482	0.5527	0.0910	-24	-90
κ Libræ	5.5	3.61	9.3	19 21.4	6 26.0	- 0 17.9	-1.1894	0.5553	0.0834	-52	-90
λ Libræ	4.4	3.69	8.4	19 52.2	11 34.0	+ 4 39.5	-1.0387	0.5584	0.0738	-39	-90
ω^1 Scorpii	4.6	+3.79	- 7.5	-20 24.0	17 32.5	+10 25.6	-0.8751	0.5619	-0.0624	-28	-90
ω^2 Scorpii	4.6	3.80	7.6	20 36.1	17 48.1	+10 40.7	-0.6771	0.5620	0.0618	-16	-90
B. A. C. 5395	7.0	3.85	7.1	21 8.8	20 33.9	-10 39.3	-0.2575	0.5636	0.0564	+ 6	-54
ω Ophiuchi	4.7	3.97	5.5	21 15.2	5 4 37.0	- 2 53.2	-0.5292	0.5680	0.0400	-10	-75
URANUS				21 42.2	4 58.8	- 2 32.3	-0.0672	0.5686	0.0392	+15	-42
24 Ophiuchi	5.9	+4.16	- 3.6	-22 59.5	15 10.7	+ 7 17.6	+1.0050	0.5736	-0.0173	+67	+24
B. A. C. 5758	6.6	4.16	2.2	21 25.6	19 11.8	+11 10.0	-0.6962	0.5749	-0.0085	-23	-90
ξ Ophiuchi	5.1	4.24	- 0.6	21 0.3	6 1 25.9	- 6 49.8	-1.1444	0.5778	+0.0055	-54	-90
52 Ophiuchi	6.5	4.32	+ 0.6	21 58.6	7 24.4	- 1 4.6	-0.0534	0.5801	0.0190	+13	-41
B. A. C. 5954	6.8	4.34	1.0	21 51.2	8 50.6	+ 0 18.5	-0.1520	0.5805	0.0223	+ 9	-47
58 Ophiuchi	5.4	+4.35	+ 1.6	-21 38.1	10 47.8	+ 2 11.3	-0.3326	0.5812	+0.0268	- 1	-59
SATURN				22 32.4	18 15.9	+ 9 22.5	+0.8714	0.5851	0.0441	+67	+14
B. A. C. 6098	6.0	4.40	3.8	20 44.2	18 45.0	+ 9 50.5	-0.9756	0.5835	0.0454	-37	-90
Piazzi 17^h 334	5.3	4.47	3.5	22 50.3	19 15.1	+10 19.5	+1.2247	0.5836	0.0463	+67	+48
μ Sagittarii	4.1	4.45	4.9	21 5.0	23 19.9	- 9 45.0	-0.3828	0.5846	0.0557	- 1	-63
14 Sagittarii	6.0	+4.47	+ 4.8	-21 44.3	23 31.6	- 9 33.7	+0.3042	0.5846	+0.0562	+37	-21
15 Sagittarii	5.8	4.44	5.2	20 45.4	23 56.1	- 9 10.1	-0.6861	0.5846	0.0571	-17	-90
16 Sagittarii	6.6	4.43	5.2	20 25.0	23 56.5	- 9 9.8	-1.0368	0.5846	0.0571	-41	-90
17 Sagittarii	7.0	4.44	5.4	20 34.6	7 0 30.1	- 8 37.3	-0.8397	0.5848	0.0584	-27	-90
21 Sagittarii	5.1	4.47	6.3	20 35.6	4 5.9	- 5 9.7	-0.5952	0.5854	0.0667	-12	-82
B. A. C. 6336	6.2	+4.53	+ 7.3	-21 28.7	9 13.7	- 0 13.6	+0.6868	0.5861	+0.0784	+67	+ 1
B. A. C. 6347	6.0	4.52	7.5	21 8.0	9 38.4	+ 0 10.2	+0.3639	0.5862	0.0793	+43	-17
B. A. C. 6386	7.3	4.53	8.6	20 22.8	13 19.5	+ 3 42.9	-0.0991	0.5865	0.0876	+18	-44
29 Sagittarii	5.5	4.53	8.8	20 26.2	14 3.5	+ 4 25.2	+0.0219	0.5866	0.0893	+24	-37
ξ^1 Sagittarii	5.7	4.55	9.6	20 47.1	17 11.3	+ 7 25.8	+0.6682	0.5868	0.0962	+68	0
ξ^2 Sagittarii	3.5	+4.58	+ 9.5	-21 14.1	17 20.3	+ 7 34.4	+1.1428	0.5868	+0.0964	+69	+36
Lalande 35497	6.4	4.53	10.4	19 23.2	19 33.1	+ 9 42.2	-0.5235	0.5869	0.1015	- 4	-74
B. A. C. 6536	5.8	4.54	11.0	19 26.6	21 40.9	+11 45.2	-0.2444	0.5869	0.1061	+11	-53
d Sagittarii	5.0	4.55	12.0	19 7.7	8 1 30.8	- 8 33.8	-0.1430	0.5869	0.1144	+17	-46
ρ^1 Sagittarii	4.2	4.52	12.5	18 1.9	3 11.0	- 6 57.4	-1.0605	0.5869	0.1180	-37	-90
ρ^2 Sagittarii	6.5	+4.54	+12.4	-18 29.4	3 14.6	- 6 53.9	-0.5888	0.5869	+0.1181	- 6	-80
B. A. C. 6707	6.4	4.58	13.8	19 4.2	9 12.4	- 1 9.7	+0.7394	0.5866	0.1305	+70	+ 4
B. A. C. 6710	5.8	4.56	13.9	18 27.0	9 28.4	- 0 54.3	+0.1471	0.5865	0.1310	+35	-30
B. A. C. 6992	6.7	4.50	18.3	15 5.7	9 3 30.5	- 7 33.2	-0.5462	0.5841	0.1653	+ 1	-75
β Capricorni	3.2	4.50	18.3	15 5.5	3 36.3	- 7 27.6	-0.5332	0.5841	0.1654	+ 2	-73
B. A. C. 7087	6.3	+4.48	+19.3	-14 3.6	9 4.7	- 2 11.5	-0.6341	0.5831	+0.1746	- 3	-83
τ^1 Capricorni	7.0	4.51	19.6	15 29.3	10 22.5	- 0 56.6	+1.0211	0.5828	0.1767	+75	+22
τ^2 Capricorni	5.6	4.50	19.7	15 18.0	11 10.6	- 0 10.4	+0.9730	0.5827	0.1780	+75	+18
8 Aquarii	6.8	4.45	21.4	13 26.1	19 48.7	+ 8 8.5	+0.7101	0.5808	0.1910	+77	+ 1
ν Aquarii	4.7	4.41	22.1	11 46.2	23 52.9	-11 56.4	-0.1569	0.5799	0.1964	+25	-47
B. A. C. 7408	6.9	+4.36	+22.9	- 9 44.8	10 5 6.9	- 6 54.0	-1.1229	0.5787	+0.2030	-32	-90
17 Aquarii	6.2	4.36	22.9	9 44.4	5 31.3	- 6 30.5	-1.0470	0.5786	0.2035	-26	-90
19 Aquarii	5.8	4.37	22.9	10 10.1	6 26.8	- 5 35.2	-0.4269	0.5784	0.2046	+11	-64
ξ Aquarii	4.8	4.32	23.7	8 17.8	11 47.3	- 0 28.3	-1.1782	0.5772	0.2103	-36	-90
B. A. C. 7562	5.5	4.33	24.1	9 29.4	14 49.3	+ 2 27.0	+0.6462	0.5766	0.2133	+77	- 3
c^1 Capricorni	5.5	+4.33	+24.1	- 9 32.1	14 51.4	+ 2 29.0	+0.6985	0.5765	+0.2134	+80	0

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
c^{2} Capricorni	6.4	+4.33	+24.2	− 9 43.9	**10** 15 23.5	+ 3 0.0	+1.0064	0.5764	+0.2139	+80	+20
30 Aquarii	5.8	4.27	24.8	6 59.9	22 39.3	+ 9 59.9	−0.1194	0.5749	0.2200	+30	−45
B. A. C. 7744	6.7	4.23	25.0	5 12.4	**11** 2 42.9	−10 5.4	−0.9900	0.5742	0.2228	−18	−90
B. A. C. 7752	6.7	4.23	25.1	4 56.4	3 11.9	− 9 37.5	−1.1456	0.5740	0.2231	−30	−90
51 Aquarii	5.8	4.21	25.4	5 20.2	7 35.3	− 5 23.6	+0.2311	0.5733	0.2257	+50	−25
κ Aquarii	5.2	+4.16	+25.7	− 4 44.2	13 27.6	+ 0 16.0	+0.9727	0.5723	+0.2283	+85	+17
Lalande 44337	6.3	4.16	25.7	4 4.0	14 45.9	+ 1 31.5	+0.6091	0.5721	0.2288	+78	− 5
3 Piscium	6.4	4.10	25.6	− 0 20.6	23 20.4	+ 9 47.5	+1.0923	0.5709	0.2307	−26	−90
κ Piscium	4.7	4.04	25.5	+ 0 42.9	**12** 10 43.2	− 3 14.0	+0.4898	0.5700	0.2304	+69	−11
9 Piscium	6.6	4.03	25.6	0 34.8	10 51.5	− 3 6.0	+0.6551	0.5708	0.2304	+84	− 2
16 Piscium	5.8	+4.00	+25.4	+ 1 33.3	14 49.6	+ 0 43.5	+0.6055	0.5698	+0.2295	+79	− 5
19 Piscium	4.9	3.98	25.0	2 56.3	19 9.5	+ 4 54.1	+0.2282	0.5697	0.2281	+51	−25
d Piscium	5.3	3.90	23.4	7 38.5	**13** 9 57.4	− 4 49.8	−1.1113	0.5700	0.2198	−27	−82
45 Piscium	6.9	3.88	23.3	7 8.7	12 9.4	− 2 42.4	−0.1369	0.5701	0.2182	+30	−44
104 Piscium	7.5	3.72	19.0	13 47.0	**14** 19 40.9	+ 3 40.9	−0.4178	0.5737	0.1825	+14	−37
27 Arietis	6.3	+3.58	+14.1	+17 15.9	**15** 17 27.3	+ 0 39.4	−0.3210	0.5769	+0.1467	+20	−47
36 Arietis	6.5	3.53	13.3	17 20.7	23 4.7	+ 6 4.4	+0.3944	0.5776	0.1362	+63	− 6
40 Arietis	6.3	3.52	12.8	17 52.2	**16** 0 50.2	+ 7 45.9	+0.0949	0.5779	0.1328	+43	−22
π Arietis	5.7	3.50	13.1	17 3.1	1 9.9	+ 8 4.9	+0.9732	0.5779	0.1322	+90	+28
ρ^{1} Arietis	7.0	3.48	12.6	17 20.9	3 30.8	+10 20.6	+0.9801	0.5782	0.1276	+90	+29
ρ^{2} Arietis	6.0	+3.49	+12.3	+17 55.8	3 52.8	+10 41.7	+0.4302	0.5782	+0.1269	+66	− 4
ρ^{3} Arietis	6.0	3.49	12.3	17 37.7	4 8.0	+10 56.4	+0.7706	0.5782	0.1264	+90	+16
50 Arietis	6.8	3.46	12.0	17 36.7	6 17.2	−10 59.2	+1.0564	0.5785	0.1220	+90	+37
54 Arietis	6.3	3.45	11.3	18 24.9	9 6.5	− 8 16.2	+0.5726	0.5788	0.1165	+78	+ 5
δ Arietis	4.0	3.46	10.7	19 21.1	10 27.5	− 6 58.2	−0.2314	0.5789	0.1137	+25	−38
τ^{2} Arietis	5.3	+3.43	+ 9.5	+20 23.2	15 5.3	− 2 30.7	−0.7899	0.5792	+0.1142	− 8	−70
65 Arietis	6.0	3.42	9.4	20 27.1	15 47.2	− 1 50.4	−0.7851	0.5793	0.1027	− 7	−70
13 Tauri	5.7	3.33	8.4	19 22.9	23 14.6	+ 5 20.4	+1.0238	0.5795	0.0867	+90	+37
14 Tauri	6.3	3.33	8.3	19 21.1	23 51.0	+ 5 55.4	+1.1082	0.5795	0.0855	+90	+44
B. A. C. 1143	6.0	3.34	7.8	20 36.9	**17** 0 7.2	+ 6 11.1	−0.1724	0.5795	0.0850	+28	−32
B. A. C. 1242	6.3	+3.24	+ 6.8	+19 55.3	7 3.4	−11 8.2	+1.0835	0.5795	+0.0698	+90	+43
A^{1} Tauri	4.6	3.28	5.8	21 48.6	8 30.8	− 9 44.1	−0.7731	0.5795	0.0666	− 7	−68
A^{2} Tauri	6.3	3.27	5.9	21 44.5	8 46.7	− 9 28.8	−0.6839	0.5794	0.0660	− 1	−66
ω^{2} Tauri	5.7	3.18	5.4	20 20.1	13 46.7	− 4 39.9	+1.0784	0.5792	0.0549	+90	+44
51 Tauri	6.0	3.20	5.0	21 20.2	14 13.5	− 4 14.2	+0.0618	0.5791	0.0539	+41	−16
53 Tauri	6.0	+3.18	+ 5.0	+20 54.1	14 40.3	− 3 48.3	+0.5371	0.5791	+0.0529	+75	+ 9
56 Tauri	6.0	3.20	4.8	21 32.0	14 44.1	− 3 44.7	−0.1156	0.5791	0.0528	+31	−26
χ^{1} Tauri	4.7	3.18	4.2	22 4.0	17 7.4	− 1 26.7	−0.5505	0.5785	0.0474	+ 7	−53
χ^{2} Tauri	6.3	3.18	4.2	21 58.3	17 8.7	− 1 25.5	−0.4522	0.5785	0.0474	+12	−46
υ^{1} Tauri	4.7	3.19	3.9	22 35.3	17 30.5	− 1 4.4	−1.0758	0.5785	0.0465	−30	−67
B. A. C. 1373	6.0	+3.16	+ 4.2	+21 23.9	18 14.4	− 0 22.2	+0.1962	0.5785	+0.0449	+50	− 8
τ Tauri	4.5	3.12	2.7	22 45.9	**18** 0 10.2	+ 5 20.4	−1.0041	0.5781	0.0316	−24	−67
ι Tauri	5.0	3.00	1.6	21 26.8	8 56.8	−10 12.4	+0.5654	0.5763	0.0119	+78	+15
105 Tauri	6.0	2.97	1.2	21 34.4	10 59.0	− 8 14.7	+0.4541	0.5750	+0.0074	+66	+ 9
108 Tauri	6.3	2.95	0.5	22 10.3	14 9.5	− 5 11.2	−0.1619	0.5750	0.0000	+28	−24
n Tauri	5.7	+2.93	+ 0.2	+21 59.6	15 46.6	− 3 37.7	+0.0225	0.5749	−0.0032	+40	−13
ο Tauri	6.0	2.89	− 0.3	21 51.1	19 19.8	− 0 12.2	+0.1464	0.5739	0.0112	+47	− 7
ζ Tauri	3.3	2.82	0.8	21 4.9	23 36.7	+ 3 55.3	+0.8932	0.5727	0.0205	+90	+33
NEPTUNE				22 14.4	**19** 9 26.8	−10 35.8	−0.6380	0.5683	0.0415	+ 1	−60
141 Tauri	6.7	2.73	2.8	22 23.8	9 56.1	−10 7.6	−0.8259	0.5692	0.0425	−11	−68
η Geminorum	3.5	+2.67	− 3.8	+22 32.1	15 40.4	− 4 35.4	−1.2527	0.5670	−0.0543	−54	−67
14 Geminorum	7.2	2.60	4.2	21 41.9	20 26.4	+ 0 0.5	−0.6489	0.5650	0.0639	+ 1	−63
15 Geminor (2^{d} star)	7.0	2.58	4.1	20 51.0	21 22.0	+ 0 54.1	+0.1990	0.5646	0.0657	+50	−10
16 Geminorum	6.8	2.57	4.0	20 33.3	21 26.7	+ 0 58.6	+0.5069	0.5646	0.0659	+72	+ 6
ν Geminorum	4.2	2.56	4.0	20 16.5	21 53.9	+ 1 24.9	+0.7777	0.5643	0.0668	+90	+22
ζ Geminorum	4.0	+2.42	− 6.2	+20 42.9	**20** 13 36.9	− 6 34.8	−0.9806	0.5571	−0.0964	−21	−69

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x'*	*y'*	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
f Geminorum	6.0	+2.23	− 7.5	+17 54.0	**21** 5 58.0	+ 8 23.5	+0.2458	0.5488	−0.1236	+53	−14
g Geminorum	5.3	2.19	8.1	18 45.1	9 4.7	+11 24.1	−1.0674	0.5472	0.1283	−27	−71
1 Cancri	6.3	2.15	8.0	16 3.2	14 16.3	− 7 34.5	+1.1653	0.5446	0.1360	+90	+43
3 Cancri	6.0	2.15	8.5	17 34.8	16 3.2	− 5 51.1	−0.7320	0.5437	0.1385	− 3	−72
5 Cancri	6.3	2.14	8.4	16 43.7	16 24.6	− 5 30.3	+0.1419	0.5435	0.1390	+46	−21
29 Cancri	6.0	+2.03	− 9.2	+14 32.4	**22** 5 34.7	+ 7 14.8	+0.5767	0.5368	−0.1561	+77	0
A¹ Cancri	6.0	1.97	9.6	13 2.2	12 48.3	− 9 45.1	+1.0583	0.5333	0.1644	+90	−30
60 Cancri	6.0	1.93	9.9	12 0.3	19 10.8	− 3 34.3	+1.1178	0.5303	0.1710	+90	+33
*a*² Cancri	4.0	1.93	10.1	12 14.5	20 27.8	− 2 19.7	+0.6391	0.5297	0.1722	+84	+ 2
				NEW	*MOON.*						
*p*⁶ Leonis	5.7	+1.80	−12.7	+ 0 28.3	**25** 20 5.4	− 4 45.9	−0.3130	0.5295	−0.2051	−21	−56
e Leonis	5.3	1.83	13.1	− 2 27.3	**26** 5 7.0	+ 4 0.6	+1.0864	0.5290	0.2044	+88	+25
χ Virginis	5.2	2.04	13.3	7 27.0	**27** 18 29.3	− 7 39.9	−0.7921	0.5124	0.1904	− 7	−90
ψ Virginis	5.2	2.11	13.3	9 0.0	**28** 2 32.8	+ 0 9.8	−0.5847	0.5143	0.1852	+ 3	−77
g Virginis	5.9	+2.18	−13.2	−10 12.6	9 42.7	+ 7 7.4	−0.5491	0.5163	−0.1798	+ 5	−74
i Virginis	5.7	2.28	13.2	12 11.5	19 34.1	− 7 18.3	−0.0817	0.5193	0.1714	+29	−42
B. A. C. 4700	5.8	2.56	12.4	15 50.0	**29** 18 6.4	− 9 26.2	+0.3409	0.5282	0.1475	+50	−19
B. A. C. 4896	6.6	2.82	10.8	17 22.6	**30** 14 10.2	+10 0.2	−0.6586	0.5376	0.1208	− 9	−88
10 Libræ	6.5	2.83	10.9	17 56.8	14 17.6	+10 7.4	−0.0492	0.5376	0.1206	+24	−40
ι¹ Libræ	5.0	+2.99	10.2	−19 25.0	**31** 0 2.4	− 4 26.4	+0.4555	0.5425	−0.1057	+52	−12
ι² Libræ	6.5	2.99	10.0	19 16.4	0 33.8	− 3 56.0	+0.2445	0.5427	0.1049	+39	−24
B. A. C. 5109	6.2	3.12	8.8	19 19.9	9 38.5	+ 4 50.9	−0.5764	0.5474	0.0900	− 7	−79
41 Libræ	5.9	3.17	8.1	18 58.5	12 34.4	+ 7 41.0	−1.2194	0.5489	0.0849	−55	−90
κ Libræ	5.5	3.18	8.0	19 21.4	13 58.9	+ 9 2.7	−0.9222	0.5495	0.0825	−29	−90
λ Libræ	5.5	+3.27	− 7.4	−19 52.2	19 13.9	− 9 52.8	−0.7718	0.5522	−0.0731	−21	−90
SEPTEMBER.											
ω¹ Scorpii	4.6	+3.36	− 6.5	−20 24.0	**1** 1 21.1	− 3 58.1	−0.6093	0.5552	−0.0618	−12	−83
ω² Scorpii	4.6	3.37	6.5	20 36.0	1 37.0	− 3 42.6	−0.4091	0.5552	0.0613	− 1	−64
JUPITER				20 10.3	2 26.5	− 2 54.9	−0.9226	0.5514	0.0588	−32	−90
B. A. C. 5395	7.0	3.42	6.2	21 8.8	4 26.9	− 0 58.6	+0.0137	0.5565	0.0559	+21	−37
ω Ophiuchi	4.7	3.54	4.7	21 15.2	12 42.7	+ 7 0.2	−0.2660	0.5606	0.0398	+ 4	−54
URANUS				−21 42.9	13 10.3	+ 7 26.8	+0.2105	0.5578	−0.0388	+30	−26
B. A. C. 5758	6.6	+3.75	− 1.8	21 25.6	**2** 3 41.7	− 2 32.3	−0.4462	0.5669	−0.0091	− 8	−67
ξ Ophiuchi	5.1	3.84	− 0.3	21 0.3	10 6.6	+ 3 38.9	−0.9062	0.5693	+0.0045	−36	−90
52 Ophiuchi	6.5	3.94	+ 0.8	21 58.6	16 15.4	+ 9 34.2	+0.1913	0.5714	0.0178	+27	−27
B. A. C. 5954	6.8	3.96	1.2	21 51.2	17 44.2	+11 0.0	+0.0900	0.5718	0.0208	+22	−32
58 Ophiuchi	5.4	+3.97	+ 1.7	−21 38.1	19 44.7	−11 3.9	−0.0946	0.5725	+0.0254	+12	−43
SATURN				22 36.4	**3** 2 26.3	− 4 37.0	+1.1437	0.5744	0.0401	+67	+37
B. A. C. 6098	6.0	4.05	3.9	20 44.2	3 55.6	− 3 11.0	−0.7554	0.5748	0.0433	−23	−90
μ Sagittarii	4.1	4.11	4.9	21 5.0	8 38.3	+ 1 21.4	−0.1619	0.5759	0.0536	+11	−47
14 Sagittarii	6.0	4.13	4.7	21 44.3	8 50.2	+ 1 32.9	+0.5325	0.5759	0.0540	+53	− 7
15 Sagittarii	5.8	+4.11	+ 5.1	−20 45.4	9 15.4	+ 1 57.2	−0.4698	0.5760	+0.0550	− 6	−69
16 Sagittarii	6.6	4.10	5.2	20 25.0	9 15.9	+ 1 57.6	−0.8245	0.5760	0.0550	−26	−90
17 Sagittarii	7.0	4.11	5.3	20 34.6	9 50.4	+ 2 30.9	−0.6257	0.5762	0.0562	−14	−85
21 Sagittarii	5.1	4.15	6.2	20 35.6	13 32.2	+ 6 4.5	−0.3834	0.5769	0.0643	0	−62
B. A. C. 6336	6.2	4.23	7.1	21 28.7	18 48.3	+11 9.0	+0.9035	0.5778	0.0758	+69	+16
B. A. C. 6347	6.0	+4.22	+ 7.3	−21 8.0	19 13.6	+11 33.3	+0.5775	0.5779	+0.0767	+58	− 5
B. A. C. 6386	7.3	4.24	8.5	20 22.8	23 0.5	− 8 48.1	+0.1034	0.5785	0.0848	+28	−32
29 Sagittarii	5.5	4.25	8.7	20 26.2	23 45.7	− 8 4.6	+0.2252	0.5785	0.0865	+35	−25
ξ¹ Sagittarii	5.7	4.28	9.4	20 47.1	**4** 2 58.2	− 4 59.3	+0.8722	0.5789	0.0933	+69	+14
Lalande 35497	6.4	4.28	10.3	19 23.3	5 23.5	− 2 39.4	−0.3357	0.5792	0.0984	+ 6	−59
B. A. C. 6536	5.8	+4.30	+10.8	−19 26.6	7 34.4	− 0 33.4	−0.0575	0.5794	+0.1030	+21	−41

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
d Sagittarii	5.0	+4.32	+11.8	−19 7.7	4 11 29.6	+ 3 13.1	+0.0377	0.5797	+0.1112	+27	−36
ρ^1 Sagittarii	4.2	4.30	12.5	18 1.9	13 12.2	+ 4 51.9	−0.8910	0.5798	0.1146	−24	−90
ρ^2 Sagittarii	6.5	4.32	12.3	18 29.4	13 15.8	+ 4 55.4	−0.4153	0.5798	0.1148	+ 3	−64
B. A. C. 6658	7.3	4.34	12.9	18 33.5	15 52.5	+ 7 26.2	−0.0393	0.5799	0.1201	+24	−40
B. A. C. 6707	6.4	4.35	14.0	19 4.2	19 21.3	+10 47.3	+0.9124	0.5800	0.1270	+71	+16
B. A. C. 6710	5.8	+4.36	+13.8	−18 27.0	19 37.6	+11 2.9	+0.3153	0.5800	+0.1276	+45	−20
g Sagittarii	5.3	4.36	16.3	15 45.1	5 4 24.4	− 4 29.8	−1.2288	0.5800	0.1445	−50	−90
B. A. C. 6992	6.7	4.41	18.5	15 5.7	13 58.4	+ 4 42.9	−0.4218	0.5798	0.1617	+ 8	−64
β Capricorni	3.2	4.41	18.5	15 5.5	14 4.3	+ 4 48.6	−0.4088	0.5797	0.1619	+ 9	−63
B. A. C. 7087	6.3	4.41	19.8	14 3.6	19 36.7	+10 8.7	−0.5231	0.5794	0.1711	+ 3	−72
τ^1 Capricorni	7.0	+4.46	+19.7	−15 29.3	20 55.3	+11 24.4	+1.1361	0.5794	+0.1733	+75	+32
τ^2 Capricorni	5.6	4.44	19.9	15 18.0	21 44.0	−11 48.7	+1.0881	0.5793	0.1745	+75	+28
8 Aquarii	6.8	4.44	21.8	13 26.1	6 6 26.4	− 3 25.6	+0.7962	0.5787	0.1877	+77	+ 7
ν Aquarii	4.7	4.43	22.8	11 46.2	10 32.0	+ 0 30.9	−0.0831	0.5785	0.1933	+29	−42
B. A. C. 7408	6.9	4.41	23.9	9 44.8	15 47.0	+ 5 34.3	−1.0607	0.5781	0.2001	−27	−90
17 Aquarii	6.2	+4.41	+23.9	− 9 44.3	16 11.4	+ 5 57.8	−0.9859	0.5780	+0.2006	−22	−90
19 Aquarii	5.8	4.42	23.9	10 10.1	17 8.8	+ 6 53.1	−0.3679	0.5780	0.2017	+14	−60
ξ Aquarii	4.8	4.41	25.0	8 17.8	22 27.7	−11 59.7	−1.1320	0.5777	0.2078	−32	−90
B. A. C. 7562	5.5	4.43	25.2	9 29.4	7 1 29.2	− 9 4.9	+0.6818	0.5774	0.2109	+80	0
c^1 Capricorni	5.5	4.43	25.2	9 32.1	1 31.3	− 9 2.9	+0.7341	0.5774	0.2109	+80	+ 3
c^2 Capricorni	6.4	+4.43	+25.3	− 9 43.8	2 3.3	− 8 32.0	+1.0400	0.5774	+0.2114	+80	+22
30 Aquarii	5.8	4.41	26.4	6 59.9	9 17.0	− 1 34.2	−0.1039	0.5770	0.2179	+31	−43
B. A. C. 7744	6.7	4.39	26.9	5 12.4	13 18.8	+ 2 18.8	−0.9827	0.5769	0.2211	−19	−90
B. A. C. 7752	6.7	4.40	27.0	4 56.4	13 47.6	+ 2 46.5	−1.1388	0.5768	0.2214	−31	−90
51 Aquarii	5.8	4.40	27.3	5 20.1	18 8.4	+ 6 57.8	+0.2200	0.5767	0.2242	+49	−26
κ Aquarii	5.2	+4.38	+27.6	− 4 44.2	23 56.4	−11 27.0	+0.9404	0.5766	+0.2272	+85	+15
Lalande 44337	6.3	4.38	27.8	4 3.9	8 1 13.7	−10 12.5	+0.5754	0.5766	0.2278	+76	− 7
3 Piscium	6.4	4.36	28.3	− 0 20.6	9 40.0	− 2 4.7	−1.1374	0.5767	0.2303	−30	−90
κ Piscium	4.7	4.36	28.4	+ 0 42.9	20 49.1	+ 8 39.9	+0.4013	0.5773	0.2306	+62	−16
9 Piscium	6.6	4.36	28.4	0 35.0	20 57.2	+ 8 47.7	+0.5610	0.5773	0.2306	+74	− 7
16 Piscium	5.8	+4.36	+28.4	+ 1 33.3	9 0 49.8	−11 28.2	+0.5038	0.5776	+0.2300	+70	−10
19 Piscium	4.9	4.36	28.3	2 56.4	5 3.4	− 7 23.9	+0.1194	0.5779	0.2288	+44	−30
45 Piscium	6.9	4.36	27.0	7 8.8	21 35.0	+ 8 31.2	−0.2826	0.5799	0.2195	+22	−52
104 Piscium	7.5	4.36	22.5	13 47.1	11 4 4.4	−10 7.8	−0.6037	0.5848	0.1843	+ 5	−70
27 Arietis	6.3	4.32	18.0	17 16.0	12 1 8.2	+10 8.0	−0.5539	0.5876	0.1482	+ 7	−63
36 Arietis	6.5	+4.28	+16.9	+17 20.7	6 34.7	− 8 37.9	+0.1442	0.5880	+0.1376	+46	−20
40 Arietis	6.3	4.28	16.4	17 52.3	8 17.0	− 6 59.5	−0.1520	0.5882	0.1342	+29	−36
π Arietis	5.7	4.26	16.6	17 3.2	8 36.0	− 6 41.3	+0.7119	0.5882	0.1335	+90	+11
ρ^1 Arietis	7.0	4.25	16.0	17 20.9	10 52.5	− 4 30.0	+0.7142	0.5883	0.1289	+90	+12
ρ^2 Arietis	6.0	4.26	15.8	17 55.9	11 13.8	− 4 9.6	+0.1752	0.5883	0.1281	+48	−17
ρ^3 Arietis	6.0	+4.26	+15.9	+17 37.7	11 28.4	− 3 55.5	+0.5098	0.5884	+0.1277	+72	+ 1
50 Arietis	6.8	4.25	15.4	17 36.7	13 33.7	− 1 55.0	+0.7897	0.5884	0.1233	+90	+17
53 Arietis	6.3	4.21	15.0	17 29.9	15 56.4	+ 0 22.2	+1.1932	0.5885	0.1184	+90	+49
54 Arietis	6.3	4.23	14.6	18 24.9	16 17.9	+ 0 42.9	+0.3112	0.5885	0.1176	+57	− 9
δ Arietis	4.0	4.26	14.0	17 21.2	17 36.5	+ 1 58.5	−0.4818	0.5885	0.1148	+11	−54
τ^2 Arietis	5.3	+4.24	+12.8	+20 23.3	22 6.3	+ 6 17.9	−1.0350	0.5885	+0.1051	−26	−70
65 Arietis	6.0	4.23	12.8	20 27.2	22 46.9	+ 6 56.9	−1.0310	0.5885	0.1037	−25	−70
13 Tauri	5.7	4.14	11.3	19 23.0	13 6 1.9	−10 4.7	+0.7479	0.5881	0.0877	+90	+18
14 Tauri	6.3	4.14	11.2	19 21.1	6 37.4	− 9 30.6	+0.8315	0.5880	0.0863	+90	+24
B. A. C. 1143	6.0	4.17	10.7	20 37.0	6 53.1	− 9 15.5	−0.4320	0.5880	0.0858	+13	−48
B. A. C. 1242	6.3	+4.08	+ 9.3	+19 55.3	13 38.7	− 2 45.5	+0.8044	0.5873	+0.0705	+90	+23
A^1 Tauri	4.6	4.13	8.4	21 48.6	15 4.0	− 1 23.4	−1.0281	0.5871	0.0672	−26	−68
A^2 Tauri	6.3	4.13	8.3	21 44.5	15 19.5	− 1 8.5	−0.9402	0.5870	0.0666	−19	−68
ω^2 Tauri	5.7	4.03	7.7	20 20.3	20 12.5	+ 3 33.3	+0.7986	0.5862	0.0554	+90	+24
51 Tauri	6.0	4.06	7.3	21 20.2	20 38.7	+ 3 58.5	−0.2057	0.5861	0.0544	+26	−31
53 Tauri	6.0	+4.03	+ 7.4	+20 54.1	21 4.9	+ 4 23.8	+0.2638	0.5860	+0.0534	+54	− 5

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle. H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
56 Tauri	6.0	+4.05	+ 7.1	+21 32.0	13 21 8.6	+ 4 27.3	−0.3809	0.5860	+0.0533	+16	−42
χ^1 Tauri	4.7	4.04	6.3	22 4.0	23 28.8	+ 6 42.2	−0.8112	0.5855	0.0479	−10	−68
χ^2 Tauri	6.3	4.05	6.4	21 58.4	23 30.1	+ 6 43.4	−0.7138	0.5855	0.0478	− 4	−67
B. A. C. 1373	6.0	4.02	6.3	21 23.9	14 0 34.3	+ 7 45.2	−0.0734	0.5853	0.0454	+33	−23
W. 4^h 650	6.0	3.94	6.7	20 29.1	4 47.3	+11 48.6	+1.0394	0.5845	0.0357	+90	+43
ι Tauri	5.0	+3.85	+ 3.0	+21 26.9	15 0.0	− 2 21.7	+0.2926	0.5818	+0.0123	+56	0
105 Tauri	6.0	3.81	2.5	21 34.4	17 0.2	− 0 26.0	+0.1829	0.5807	0.0078	+49	− 5
108 Tauri	6.3	3.81	1.6	22 10.3	20 7.8	+ 2 34.6	−0.4266	0.5796	+0.0007	+13	−40
n Tauri	5.7	3.78	1.3	21 59.6	21 43.5	+ 4 6.7	−0.2434	0.5790	−0.0029	+24	−28
o Tauri	6.0	3.73	+ 0.6	21 51.1	15 1 13.7	+ 7 29.1	−0.1196	0.5776	0.0107	+31	−22
ζ Tauri	3.3	+3.66	0.0	+21 4.9	5 27.5	+11 33.5	+0.6224	0.5759	−0.0200	+85	+17
141 Tauri	6.7	3.57	− 2.6	22 23.8	15 40.6	− 2 35.6	−1.0788	0.5712	0.0418	−31	−68
Neptune				22 13.8	16 0.3	− 2 16.3	−0.9158	0.5706	0.0425	−17	−68
χ^4 Orionis	5.0	3.50	2.0	20 8.4	16 40.6	− 1 37.9	+1.2588	0.5707	0.0439	+90	+65
14 Geminorum	7.2	3.41	4.4	21 41.9	16 2 6.4	+ 7 27.8	−0.8945	0.5660	0.0630	−16	−68
15 Geminor. (2^d *star*)	7.0	+3.38	− 4.2	+20 51.0	3 1.8	+ 8 21.3	−0.0529	0.5655	−0.0648	+35	−23
16 Geminorum	6.8	3.37	4.1	20 33.3	3 6.5	+ 8 25.8	+0.2545	0.5654	0.0656	+53	− 7
ν Geminorum	4.2	3.36	4.2	20 16.5	3 33.5	+ 8 51.9	+0.5233	0.5652	0.0659	+74	+ 7
22 Geminorum	7.2	3.31	4.0	19 30.3	6 4.7	+11 17.7	+1.1692	0.5638	0.0708	+90	+51
ζ Geminorum	4.0	3.17	7.0	20 42.9	19 13.7	− 0 0.5	−1.2137	0.5566	0.0949	−47	−69
f Geminorum	6.0	+2.91	− 8.6	+17 54.0	17 11 35.6	− 8 11.5	+0.0283	0.5474	−0.1218	+39	−25
g Geminorum	5.3	2.89	9.3	18 45.1	14 42.8	− 5 10.4	−1.2788	0.5456	0.1264	−54	−71
1 Cancri	6.3	2.78	9.1	16 3.3	19 55.3	− 0 8.0	+0.9593	0.5427	0.1339	+90	+26
3 Cancri	6.0	2.79	9.8	17 34.8	21 42.7	+ 1 35.9	−0.9342	0.5418	0.1364	−17	−72
5 Cancri	6.3	2.78	9.6	16 43.7	22 4.2	+ 1 56.7	−0.0604	0.5415	0.1368	+34	−32
29 Cancri	6.0	+2.60	−10.5	+14 32.3	18 11 17.9	− 9 14.6	+0.3958	0.5343	−0.1536	+62	−10
A^1 Cancri	6.0	2.51	10.9	13 2.2	18 33.7	− 2 12.4	+0.8910	0.5311	0.1617	+90	+18
A^2 Cancri	6.0	2.48	10.9	12 28.4	20 26.4	− 0 23.2	+1.2006	0.5302	0.1637	+90	+43
60 Cancri	6.0	2.44	11.2	12 0.3	19 0 58.4	+ 4 0.7	+0.9627	0.5281	0.1682	+90	+22
a^2 Cancri	4.0	2.43	11.4	12 14.5	2 15.8	+ 5 15.8	+0.4862	0.5276	0.1695	+69	− 7
κ Cancri	5.1	+2.38	−11.5	+11 4.1	6 59.9	+ 9 51.3	+0.9610	0.5255	−0.1738	+90	+22
ω Leonis	5.9	2.28	12.0	9 29.3	17 41.5	− 3 46.1	+0.7911	0.5214	0.1825	+90	+ 9
h Leonis	5.7	2.27	12.2	10 9.6	19 30.7	− 2 0.1	−0.2733	0.5207	0.1838	+23	−50
14 Sextantis	6.6	2.12	12.5	6 5.7	20 13 55.9	− 8 6.9	+0.7107	0.5151	0.1946	+90	+ 2
16 Sextantis	6.9	2.12	12.6	6 39.5	15 14.2	− 6 50.8	−0.1645	0.5148	0.1952	+29	−46
19 Sextantis	6.2	+2.10	−12.5	+ 5 6.3	17 9.3	− 4 59.0	+1.1766	0.5143	−0.1961	+90	+35
34 Sextantis	6.7	2.02	12.7	4 6.1	21 9 13.4	+10 37.9	−0.9070	0.5113	0.2011	−13	−86
36 Sextantis	6.6	+2.01	−12.9	+ 3 0.6	10 36.0	+11 58.2	+0.0290	0.5111	−0.2014	+39	−36
				NEW	*MOON.*						
i Virginis	5.7	+2.11	−11.7	−12 11.5	25 1 30.6	+ 0 25.6	+0.0836	0.5096	−0.1702	+38	−33
B. A. C. 4700	5.6	2.30	10.7	15 50.0	26 0 1.7	− 1 43.5	+0.5446	0.5297	0.1463	+63	− 7
B. A. C. 4896	6.6	2.49	9.2	17 22.6	20 8.8	− 6 13.7	−0.4328	0.5380	0.1195	+ 4	−65
10 Libræ	6.5	2.49	9.2	17 56.8	20 16.2	− 6 6.5	+0.1797	0.5381	0.1194	+37	−27
ι^1 Libræ	5.0	2.62	8.5	19 24.9	27 6 4.5	+ 3 23.1	+0.6971	0.5421	0.1045	+70	+ 2
ι^2 Libræ	6.5	+2.61	− 8.4	−19 16.4	6 36.3	+ 3 53.9	+0.4852	0.5423	−0.1037	+54	−10
B. A. C. 5109	6.2	2.72	7.2	19 19.9	15 45.6	−11 14.6	−0.3323	0.5462	0.0888	+ 6	−58
41 Libræ	5.9	2.75	6.7	18 58.5	18 43.3	− 8 22.7	−0.9784	0.5474	0.0837	−33	−90
κ Libræ	5.5	2.77	6.7	19 21.4	20 8.7	− 7 0.1	−0.6773	0.5480	0.0813	−14	−90
λ Libræ	4.4	2.84	6.0	19 52.2	28 1 27.6	− 1 51.7	−0.5227	0.5501	0.0720	− 6	−73
β^1 Scorpii	2.9	+2.89	− 5.0	−19 32.0	7 2.9	+ 3 32.6	−1.2622	0.5522	−0.0619	−64	−90
ω^1 Scorpii	4.6	2.92	5.2	20 24.0	7 39.8	+ 4 8.2	−0.3557	0.5525	0.0608	+ 2	−60
ω^2 Scorpii	4.6	2.93	5.2	20 36.0	7 55.8	+ 4 23.8	−0.1538	0.5526	0.0603	+13	−47
B. A. C. 5395	7.0	2.97	4.9	21 8.7	10 48.5	+ 7 10.6	+0.2740	0.5536	0.0550	+36	−22
Jupiter				20 54.6	15 40.6	+11 52.8	−0.2283	0.5483	0.0444	+ 7	−51
ω Ophiuchi	4.7	+3.07	− 3.5	−21 15.2	19 12.7	− 8 42.2	−0.0048	0.5566	−0.0390	+18	−38

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0		Apparent Declination.	Washington Mean Time.	Hour Angle. *H*	*Y*	*x*′	*y*′	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
Uranus				−21 49.4	**28** 20 58.3	− 7 0.3	+0.5464	0.5556	−0.0354	+52	− 6
B. A. C. 5758	6.6	+3.26	− 1.0	21 25.6	**29** 10 30.3	+ 6 3.8	−0.1841	0.5614	−0.0088	+ 6	−49
ξ Ophiuchi	5.1	3.35	+ 0.3	21 0.3	17 4.4	−11 35.8	−0.6492	0.5630	+0.0046	−21	−88
52 Ophiuchi	6.5	3.43	1.2	21 58.6	23 22.7	− 5 30.8	+0.4612	0.5645	0.0175	+44	−11
B. A. C. 5954	6.8	3.44	1.6	21 51.2	**30** 0 53.8	− 4 2.8	+0.3584	0.5647	0.0207	+38	−17
58 Ophiuchi	5.4	+3.46	+ 2.1	−21 38.1	2 57.8	− 2 3.1	+0.1712	0.5649	+0.0250	+27	−27
B. A. C. 6098	6.0	3.54	4.1	20 44.1	11 22.6	+ 6 3.8	−0.5007	0.5668	0.0423	− 8	−72
μ Sagittarii	4.1	3.61	5.0	21 5.0	16 13.9	+10 44.8	+0.0993	0.5675	0.0525	+25	−32
14 Sagittarii	6.0	3.63	4.7	21 44.3	16 26.1	+10 56.5	+0.8032	0.5676	0.0529	+68	+ 9
15 Sagittarii	5.8	3.61	5.2	20 45.4	16 52.2	+11 21.5	−0.2132	0.5676	0.0538	+ 8	−50
16 Sagittarii	6.6	+3.60	+ 5.3	−20 25.0	16 52.6	+11 22.1	−0.5728	0.5676	+0.0538	−11	−79
17 Sagittarii	7.0	3.61	5.4	20 34.6	17 28.2	+11 56.5	−0.3766	0.5677	0.0550	0	−61
21 Sagittarii	5.1	+3.65	+ 6.2	−20 35.6	21 16.9	− 8 23.0	−0.1279	0.5682	+0.0629	+14	−45
OCTOBER.											
B. A. C. 6336	6.2	+3.75	+ 6.9	−21 28.7	**1** 2 43.2	− 3 8.4	+1.1762	0.5687	+0.0740	+69	+41
B. A. C. 6347	6.0	3.74	7.1	21 8.0	3 9.4	− 2 43.1	+0.8442	0.5687	0.0749	+69	+12
B. A. C. 6386	7.3	3.77	8.2	20 22.9	7 3.8	+ 1 3.0	+0.3609	0.5691	0.0828	+44	−17
29 Sagittarii	5.5	+3.78	+ 8.4	−20 26.2	7 50.5	+ 1 48.0	+0.4838	0.5692	+0.0844	+52	−10
ξ^1 Sagittarii	5.7	3.81	9.1	20 47.1	11 9.5	+ 4 59.8	+1.1384	0.5693	0.0910	+69	+36
Lalande 35497	6.4	3.82	9.9	19 23.3	13 39.8	+ 7 24.7	−0.0896	0.5695	0.0960	+19	−43
B. A. C. 6536	5.8	3.84	10.1	19 26.6	15 55.2	+ 9 35.3	+0.1911	0.5696	0.1005	+35	−27
d Sagittarii	5.0	3.88	11.3	19 7.7	19 58.5	−10 30.1	+0.2842	0.5698	0.1083	+41	−22
ρ^1 Sagittarii	4.2	+3.87	+12.0	−18 1.9	21 44.5	− 8 47.9	−0.6606	0.5698	+0.1117	−10	−88
ρ^2 Sagittarii	6.5	3.88	11.8	18 29.4	21 48.2	− 8 44.3	−0.1777	0.5698	0.1119	+16	−48
B. A. C. 6658	7.3	3.91	12.4	18 33.5	**2** 0 30.4	− 6 8.0	+0.2016	0.5699	0.1170	+37	−26
B. A. C. 6710	5.8	3.95	13.2	18 27.0	4 23.3	− 2 23.5	+0.5576	0.5699	0.1241	+61	− 7
g Sagittarii	5.3	3.96	15.8	15 45.1	13 28.4	+ 6 22.1	−1.0208	0.5699	0.1407	−30	−90
B. A. C. 6992	6.7	+4.04	+17.9	−15 5.7	23 22.0	− 8 5.6	−0.2147	0.5699	+0.1573	+18	−50
β Capricorni	3.2	4.04	17.9	15 5.5	23 28.1	− 7 59.6	−0.2017	0.5698	0.1576	+19	−49
B. A. C. 7087	6.3	4.06	19.2	14 3.6	**3** 5 11.6	− 2 28.3	−0.3259	0.5698	0.1667	+14	−57
8 Aquarii	6.8	4.15	21.2	13 26.1	16 21.9	+ 8 18.0	+0.9931	0.5697	0.1829	+77	+20
ν Aquarii	4.7	4.15	22.3	11 46.2	20 34.8	−11 38.1	+0.0939	0.5697	0.1885	+39	−32
B. A. C. 7408	6.9	+4.16	+23.6	− 9 44.8	**4** 1 58.8	− 6 25.8	−0.9062	0.5698	+0.1952	−17	−90
17 Aquarii	6.2	4.16	23.7	9 44.3	2 23.9	− 6 1.6	−0.8331	0.5698	0.1957	−12	−90
19 Aquarii	5.8	4.17	23.6	10 10.1	3 22.9	− 5 4.6	−0.2074	0.5702	0.1968	+23	−49
ξ Aquarii	4.8	4.19	24.9	8 17.8	8 50.1	+ 0 10.9	−0.9918	0.5702	0.2029	−22	−90
B. A. C. 7562	5.5	4.23	25.0	9 29.4	11 56.2	+ 3 10.3	+0.8363	0.5702	0 2061	+81	+ 9
c^1 Capricorni	5.5	+4.23	+24.9	9 32.1	11 58.3	+ 3 12.3	+0.8889	0.5702	+0.2061	+80	+12
c^2 Capricorni	6.4	4.23	24.9	9 43.8	12 31.2	+ 3 44.1	+1.1974	0.5702	0.2066	+80	+37
30 Aquarii	5.8	4.25	26.4	6 59.9	19 54.7	+10 51.7	+0.0241	0.5707	0.2133	+37	−36
B. A. C. 7744	6.7	4.25	27.2	5 12.4	**5** 0 1.5	− 9 10.3	−0.8721	0.5710	0.2165	−12	−90
B. A. C. 7752	6.7	4.26	27.3	4 56.4	0 30.9	− 8 42.0	−1.0305	0.5711	0.2168	−23	−90
51 Aquarii	5.8	+4.29	+27.5	− 5 20.1	4 56.4	− 4 26.0	+0.3293	0.5716	+0.2198	+56	−20
κ Aquarii	5.2	4.31	28.0	4 44.2	10 50.1	+ 1 15.0	+1.0403	0.5723	0.2230	+85	+22
Lalande 44337	6.3	4.32	28.3	4 3.9	12 8.4	+ 2 30.5	+0.6688	0.5725	0.2236	+83	− 1
3 Piscium	6.4	4.35	29.3	− 0 20.6	20 40.9	+10 44.5	−1.0589	0.5739	0.2266	−24	−90
κ Piscium	4.7	4.41	29.5	+ 0 43.0	**6** 7 54.7	− 2 26.2	+0.4395	0.5763	0.2276	+65	−14
9 Piscium	6.6	+4.42	+29.5	+ 0 34.9	8 2.9	− 2 18.3	+0.6030	0.5763	+0.2276	+78	− 5
16 Piscium	5.8	4.43	29.7	1 33.3	11 56.3	+ 1 26.6	+0.5322	0.5772	0.2272	+72	− 9
19 Piscium	4.9	4.45	29.7	2 56.4	16 10.2	+ 5 31.2	+0.1357	0.5780	0.2262	+45	−30
45 Piscium	6.9	4.56	29.1	7 8.8	**7** 8 37.9	− 2 37.7	−0.3086	0.5829	0.2231	+21	−54
104 Piscium	7.5	4.75	25.3	13 47.1	**8** 13 39.7	+ 1 15.5	−0.6987	0.5923	0.1844	− 1	−76
27 Arietis	6.3	+4.85	+20.8	+17 16.0	**9** 11 12.2	− 2 0.0	−0.6902	0.5973	+0.1487	− 1	−72

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0. Δα	Red'ns from 1900.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
36 Arietis	6.5	+4.84	+19.5	+17 20.8	9 16 29.5	+ 3 4.9	−0.0106	0.5981	+0.1381	+37	−28
40 Arietis	6.3	4.86	19.1	17 52.4	18 8.8	+ 4 40.3	−0.3057	0.5981	0.1346	+20	−45
π Arietis	5.7	4.83	19.2	17 3.2	18 27.2	+ 4 57.9	+0.5457	0.5984	0.1340	+75	+ 2
ρ^2 Arietis	6.0	4.85	18.4	17 55.9	21 0.3	+ 7 25.0	+0.0119	0.5987	0.1287	+38	−26
ρ^3 Arietis	6.0	4.85	18.5	17 37.8	21 14.6	+ 7 38.7	+0.3418	0.5987	0.1274	+59	− 8
50 Arietis	6.8	+4.83	+17.9	+17 36.8	23 16.1	+ 7 35.4	+0.6142	0.5989	+0.1258	+82	+ 5
53 Arietis	6.3	4.82	17.3	17 29.8	10 1 34.4	+11 48.3	+1.0080	0.5991	0.1189	+90	+33
54 Arietis	6.3	4.85	17.1	18 25.0	1 55.3	−11 51.7	+0.1376	0.5991	0.1181	+46	−18
δ Arietis	4.0	4.87	16.6	19 21.2	3 11.4	−10 38.6	−0.6458	0.5992	0.1153	− 1	−66
τ^2 Arietis	5.3	4.89	15.3	20 23.3	7 32.8	− 6 27.6	−1.1976	0.5994	0.1056	−42	−70
65 Arietis	6.0	+4.89	+15.1	+20 27.2	8 12.2	− 5 49.8	−1.1944	0.5993	+0.1041	−41	−70
13 Tauri	5.7	4.83	13.4	19 23.0	15 13.3	+ 0 54.7	+0.5481	0.5992	0.0879	+76	+ 7
14 Tauri	6.3	4.83	13.2	19 21.2	15 47.6	+ 1 27.6	+0.6289	0.5991	0.0865	+85	+12
B. A. C. 1143	6.0	4.87	12.9	20 37.0	16 2.9	+ 1 42.3	−0.6153	0.5991	0.0860	+ 2	−62
B. A. C. 1242	6.3	4.81	11.2	19 55.3	22 35.3	+ 7 59.1	+0.5937	0.5984	0.0705	+81	+12
A^1 Tauri	4.6	+4.87	+10.3	+21 48.7	23 57.9	+ 9 18.4	−1.2122	0.5981	+0.0673	−46	−68
A^2 Tauri	6.3	4.87	10.2	21 44.5	11 0 12.9	+ 9 32.8	−1.1247	0.5981	0.0667	−35	−68
ω^2 Tauri	5.7	4.78	9.3	20 20.1	4 56.4	− 9 54.9	+0.5801	0.5972	0.0554	+79	+12
51 Tauri	6.0	4.82	9.0	21 20.2	5 21.7	− 9 30.6	−0.4088	0.5971	0.0544	+14	−44
53 Tauri	6.0	4.80	9.0	20 54.2	5 47.2	− 9 6.0	+0.0531	0.5970	0.0533	+41	−17
56 Tauri	6.0	+4.82	+ 8.8	+21 32.1	5 50.7	− 9 2.7	−0.5818	0.5970	+0.0532	+ 4	−56
χ^1 Tauri	4.7	4.82	8.0	22 4.0	8 6.3	− 6 52.5	−1.0080	0.5965	0.0478	−25	−68
χ^2 Tauri	6.3	4.82	8.0	21 58.4	8 7.6	− 6 51.3	−0.9119	0.5965	0.0477	−17	−68
B. A. C. 1373	6.0	4.80	7.8	21 23.9	9 9.8	− 5 51.5	−0.2827	0.5961	0.0452	+21	−35
W. 4^h 650	6.0	4.69	7.0	20 29.2	13 14.6	− 1 56.3	+0.8086	0.5951	0.0354	+90	+27
ι Tauri	5.0	+4.67	+ 3.9	+21 26.9	23 8.2	+ 7 34.2	+0.0647	0.5917	+0.0118	+41	−12
105 Tauri	6.0	4.65	3.3	21 34.4	12 1 4.7	+ 9 26.3	−0.0449	0.5908	+0.0072	+35	−18
108 Tauri	6.3	4.64	2.3	22 10.3	4 6.5	−11 38.9	−0.6474	0.5895	0.0000	0	−58
η Tauri	5.7	4.62	1.9	21 59.6	5 39.4	−10 9.7	−0.4682	0.5887	−0.0035	+11	−44
υ Tauri	6.0	4.58	1.1	21 51.1	9 3.4	− 6 53.4	−0.3486	0.5871	0.0113	+17	−36
ζ Tauri	3.3	+4.51	+ 0.2	+21 4.9	13 9.9	− 2 56.3	+0.3797	0.5849	−0.0207	+62	+ 4
χ^1 Orionis	4.7	4.38	− 1.4	20 15.4	20 6.1	+ 3 44.2	+1.0389	0.5812	0.0361	+90	+43
NEPTUNE				22 12.9	23 29.5	+ 7 0.0	−1.1290	0.5794	0.0434	−36	−68
χ^4 Orionis	5.0	4.34	2.3	20 8.4	13 0 4.5	+ 7 33.7	+1.0024	0.5788	0.0447	+90	+38
16 Geminorum	6.8	4.23	4.9	20 33.3	10 14.9	− 6 38.2	+0.0096	0.5725	0.0658	+38	−20
ν Geminorum	4.2	+4.21	− 5.0	+20 16.4	10 41.3	− 6 12.7	+0.2748	0.5722	−0.0667	+54	− 6
f Geminorum	6.0	3.72	10.2	17 54.0	14 18 6.8	+ 0 7.2	−0.2123	0.5509	0.1219	+25	−39
1 Cancri	6.3	3.57	11.4	16 3.3	15 2 19.8	+ 8 4.0	+0.7142	0.5457	0.1339	+90	+11
3 Cancri	6.0	3.57	12.2	17 34.8	4 5.8	+ 9 46.5	−1.1631	0.5445	0.1363	−36	−72
5 Cancri	6.3	3.56	11.9	16 43.7	4 27.1	+10 7.1	−0.2962	0.5443	0.1367	+21	−45
29 Cancri	6.0	+3.36	−13.1	+14 32.3	17 32.9	− 1 12.1	+0.1654	0.5361	−0.1530	+46	−22
A^1 Cancri	6.0	3.23	13.5	13 2.1	16 0 45.4	+ 5 46.8	+0.6698	0.5320	0.1609	+87	+ 5
A^2 Cancri	6.0	3.20	13.5	12 28.4	2 37.6	+ 7 35.5	+0.9728	0.5310	0.1628	+90	+24
60 Cancri	6.0	3.14	13.9	12 0.3	7 8.1	+11 57.8	+0.7408	0.5286	0.1668	+90	+ 8
α^2 Cancri	4.0	3.13	14.1	12 14.5	8 25.1	−10 47.6	+0.2680	0.5279	0.1688	+53	−17
κ Cancri	5.1	+3.06	−14.2	+11 4.0	13 8.0	− 6 13.1	+0.7457	0.5269	−0.1726	+90	+ 8
ω Leonis	5.9	2.90	14.8	9 29.3	23 47.8	+ 4 7.6	+0.5877	0.5210	0.1800	+77	− 3
k Leonis	5.7	2.91	15.1	10 9.2	17 1 36.7	+ 5 53.4	−0.4691	0.5201	0 1822	+12	−63
14 Sextantis	6.6	2.69	15.1	6 5.7	20 1.5	− 0 13.8	+0.5371	0.5140	0.1926	+72	− 7
16 Sextantis	6.9	2.68	15.3	6 39.4	21 19.8	+ 1 2.3	−0.3282	0.5136	0 1932	+20	−55
19 Sextantis	6.2	+2.65	−15.0	+ 5 6.3	23 15.0	+ 2 54.2	+1.0072	0.5131	−0.1940	+90	+21
34 Sextantis	6.7	2.51	15.4	4 6.1	18 15 20.2	− 5 27.9	−1.0474	0.5101	0.1989	−23	−86
36 Sextantis	6.6	2.50	15.2	3 0.6	16 43.0	− 4 7.4	−0.1130	0.5099	0.1992	+31	−43
55 Leonis	6.2	2.45	14.9	1 15.9	22 27.1	+ 1 27.1	+0.6754	0.5094	0.2001	+86	− 1
57 Leonis	6.9	2.45	14.8	0 57.7	22 42.9	+ 1 42.5	+0.9596	0.5094	0.2001	+90	+17
p^2 Leonis	5.4	+2.42	−14.8	+ 0 32.0	19 2 46.0	+ 5 38.9	+0.6241	0.5091	−0.2005	+80	− 4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x'*	*y'*	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
p^5 Leonis	5.7	+2.38	−14.9	+ 0 28.2	**19** 8 18.0	+11 1.7	−0.4158	0.5090	−0.2007	+15	−63
e Leonis	5.3	2.33	14.4	− 2 27.2	17 20.2	− 4 11.3	+1.0230	0.5091	0.2002	+88	+21
B. A. C. 4006	6.1	2.28	14.0	4 46.9	**20** 4 37.6	+ 6 47.3	+1.3591	0.5101	0.1981	+85	+62
				NEW	*MOON.*						
B. A. C. 5109	6.2	+2.52	− 6.0	−19 19.9	**24** 21 24.8	− 3 48.0	−0.2134	0.5491	−0.0879	+12	−50
41 Libræ	5.9	2.54	5.6	18 58.4	**25** 0 21.7	− 0 56.9	−0.8561	0.5502	0.0829	−26	−90
κ Libræ	5.5	2.55	5.5	19 21.4	1 46.8	+ 0 25.4	−0.5537	0.5507	0.0804	− 8	−76
λ Libræ	4.4	2.60	4.8	19 52.2	7 4.5	+ 5 32.6	−0.3928	0.5526	0.0711	+ 1	−63
β^1 Scorpii	2.9	2.63	3.9	19 32.0	12 38.9	+10 55.9	−1.1272	0.5546	0.0610	−48	−90
ω^1 Scorpii	4.6	2.65	4.0	20 24.0	13 15.8	+11 31.5	−0.2192	0.5548	0.0599	+ 9	−51
ω^2 Scorpii	4.6	+2.66	− 4.0	−20 36.0	13 31.8	+11 47.0	−0.0166	0.5549	−0.0594	+20	−38
ω Ophiuchi	4.7	2.76	2.4	21 15.2	**26** 0 47.9	− 1 19.7	+0.1438	0.5583	0.0381	+26	−29
URANUS				22 0.3	4 52.7	+ 2 36.7	+0.8202	0.5570	0.0299	+68	+11
JUPITER				21 44.7	6 51.2	+ 4 31.3	+0.4816	0.5508	0.0251	+47	−10
B. A. C. 5758	6.6	2.89	− 0.1	21 25.6	16 7.4	−10 31.7	−0.0230	0.5618	−0.0079	+14	−38
ξ Ophiuchi	5.1	+2.96	+ 1.0	−21 0.3	22 43.5	− 4 9.3	−0.4858	0.5629	+0.0054	−11	−70
52 Ophiuchi	6.5	3.03	2.1	21 58.6	**27** 5 4.6	+ 1 58.5	+0.6345	0.5638	0.0182	+58	− 1
B. A. C. 5954	6.8	3.04	2.3	21 51.2	6 36.5	+ 3 27.3	+0.5323	0.5639	0.0213	+50	− 7
58 Ophiuchi	5.4	3.06	2.7	21 38.0	8 41.5	+ 5 27.9	+0.3452	0.5641	0.0256	+37	−18
B. A. C. 6098	6.0	3.11	4.5	20 44.1	17 11.8	−10 19.7	−0.3268	0.5647	0.0428	+ 1	−58
μ Sagittarii	4.1	+3.17	+ 5.3	−21 5.0	22 6.8	− 5 35.0	+0.2798	0.5649	+0.0527	+36	−21
14 Sagittarii	6.0	3.18	5.1	21 44.3	22 19.3	− 5 22.9	+0.9895	0.5649	0.0531	+68	+23
15 Sagittarii	5.8	3.17	5.5	20 45.4	22 45.7	− 4 57.4	−0.0349	0.5649	0.0540	+18	−39
16 Sagittarii	6.6	3.16	5.6	20 25.0	22 46.1	− 4 57.1	−0.3974	0.5649	0.0540	− 2	−63
21 Sagittarii	5.1	3.21	6.3	20 35.6	**28** 3 14.4	− 0 38.2	+0.0529	0.5649	0.0629	+23	−34
B. A. C. 6347	6.0	+3.27	+ 7.1	−21 8.0	9 12.8	+ 5 7.7	+1.0355	0.5648	+0.0747	+69	+27
29 Sagittarii	5.5	3.33	8.3	20 26.2	13 59.0	+ 9 43.9	+0.6737	0.5647	0.0839	+67	− 1
Lalande 34597	6.4	3.34	9.7	19 23.3	19 55.4	− 8 32.2	+0.0954	0.5643	0.0953	+29	−32
B. A. C. 6536	5.8	3.36	10.1	19 26.7	22 13.8	− 6 18.6	+0.3796	0.5641	0.0996	+47	−16
d Sagittarii	5.0	3.40	10.9	19 7.7	**29** 2 22.7	− 2 18.4	+0.4743	0.5638	0.1073	+54	−11
ρ^1 Sagittarii	4.2	+3.39	+11.6	−18 2.0	4 11.3	− 0 33.6	−0.4818	0.5636	+0.1105	0	−69
ρ^2 Sagittarii	6.5	3.41	11.4	18 29.4	4 15.1	− 0 29.9	+0.0071	0.5636	0.1107	+26	−37
B. A. C. 6710	5.8	3.47	12.6	18 27.0	11 0.2	+ 6 1.0	+0.7518	0.5630	0.1227	+90	+ 5
e^1 Sagittarii	5.5	3.44	13.6	16 31.1	12 39.8	+ 7 37.2	−1.0666	0.5628	0.1256	−36	−90
e^2 Sagittarii	5.4	3.45	13.8	16 21.3	13 27.8	+ 8 23.5	−1.1372	0.5628	0.1270	−42	−90
g Sagittarii	5.3	+3.50	+15.1	−15 45.2	20 20.6	− 8 58.1	−0.8495	0.5621	+0.1385	−20	−90
B. A. C. 6992	6.7	3.59	17.0	15 5.7	**30** 6 32.4	+ 0 52.5	−0.0349	0.5610	0.1546	+28	−39
β Capricorni	3.2	3.59	17.0	15 5.6	6 38.7	+ 0 58.6	−0.0218	0.5610	0.1548	+29	−38
B. A. C. 7087	6.3	3.62	18.3	14 3.6	12 33.4	+ 6 41.1	−0.1506	0.5605	0.1635	+23	−46
8 Aquarii	6.8	3.72	20.1	13 26.1	**31** 0 6.9	− 6 9.3	+1.1839	0.5596	0.1791	+77	+37
ν Aquarii	4.7	+3.74	+21.2	−11 46.2	4 28.9	− 1 56.3	+0.2669	0.5594	+0.1844	+49	−23
17 Aquarii	6.2	3.76	22.6	9 44.4	10 30.8	+ 3 53.1	−0.6786	0.5594	0.1913	− 3	−87
19 Aquarii	5.8	3.78	22.5	10 10.1	11 32.0	+ 4 52.3	−0.0448	0.5593	0.1924	+32	−40
ξ Aquarii	4.8	3.82	23.9	8 17.8	17 11.4	+10 20.0	−0.8476	0.5593	0.1982	−12	−90
B. A. C. 7562	5.5	3.86	23.8	9 29.4	20 24.5	−10 33.5	+1.0094	0.5594	0.2012	+81	+21
c^1 Capricorni	5.5	+3.86	+23.8	− 9 32.1	20 26.7	−10 31.4	+1.0629	0.5594	+0.2012	+80	+25

NOVEMBER

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle *H*	*Y*	*x'*	*y'*	N.	S.
30 Aquarii	5.8	+3.91	+25.4	− 6 59.9	**1** 4 40.9	− 2 34.2	+0.1746	0.5598	+0.2082	+46	−28
B. A. C. 7744	6.7	3.93	26.3	5 12.4	8 56.8	+ 1 32.9	−0.7416	0.5602	0.2113	− 4	−90
B. A. C. 7752	6.7	3.94	26.4	4 56.4	9 27.2	+ 2 2.2	−0.9041	0.5603	0.2116	−14	−90
51 Aquarii	5.8	3.98	26.6	5 20.1	14 2.6	+ 6 28.1	+0.4740	0.5609	0.2145	+66	−12
κ Aquarii	5.2	4.03	27.0	4 44.2	20 9.1	−11 38.1	+1.1890	0.5618	0.2177	+85	+35
Lalande 44337	6.3	+4.05	+27.4	− 4 3.9	21 30.3	−10 19.7	+0.8099	0.5620	+0.2183	+86	+ 7

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0. Δα	Red'ns from 1900.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
3 Piscium	6.4	+4.11	+28.8	− 0 20.6	2 6 20.6	− 1 41.8	−0.9745	0.5640	+0.2212	−18	−90
κ Piscium	4.7	4.23	29.1	+ 0 43.0	17 56.4	+ 9 23.6	+0.5465	0.5671	0.2225	+73	− 8
9 Piscium	6.6	4.23	29.2	0 34.9	18 4.8	+ 9 31.8	+0.7154	0.5673	0.2225	+90	+ 2
16 Piscium	5.8	4.27	29.4	1 33.3	22 5.3	−10 36.3	+0.6339	0.5684	0.2222	+81	− 1
19 Piscium	4.9	4.32	29.6	2 56.4	3 2 26.5	− 6 24.4	+0.2247	0.5699	0.2214	+50	−25
27 Arietis	6.3	+5.15	+22.3	+17 16.1	22 21.6	+10 57.8	−0.7141	0.5989	+0.1475	− 3	−75
36 Arietis	6.5	5.19	21.0	17 20.8	6 3 37.4	− 7 58.9	−0.0428	0.6007	0.1372	+35	−30
40 Arietis	6.3	5.21	20.6	17 52.4	5 16.0	− 6 24.2	−0.3403	0.6012	0.1338	+18	−47
π Arietis	5.7	5.19	20.5	17 3.3	5 34.4	− 6 6.6	+0.5098	0.6013	0.1332	+71	0
ρ^2 Arietis	6.0	5.23	19.8	17 55.9	8 6.3	− 3 40.8	−0.0270	0.6020	0.1279	+35	−28
ρ^3 Arietis	6.0	+5.24	+19.6	+17 37.8	8 20.5	− 3 27.1	+0.3016	0.6021	+0.1274	+56	−10
50 Arietis	6.8	5.23	19.2	17 36.8	10 20.9	− 1 31.5	+0.5673	0.6026	0.1231	+77	+ 5
53 Arietis	6.3	5.23	18.6	17 30.0	12 37.9	+ 0 40.0	+0.9589	0.6031	0.1182	+90	+29
54 Arietis	6.3	5.26	18.5	18 25.0	12 58.7	+ 0 59.9	+0.0918	0.6032	0.1175	+43	−20
δ Arietis	4.0	5.31	18.1	19 21.2	14 14.0	+ 2 12.2	−0.6907	0.6034	0.1147	− 2	−70
65 Arietis	6.0	+5.35	+16.6	+20 27.3	19 11.2	+ 6 57.5	−1.2428	0.6043	+0.1036	−50	−70
13 Tauri	5.7	5.34	14.5	19 23.0	7 2 6.3	−10 24.1	+0.4811	0.6051	0.0875	+70	+ 3
14 Tauri	6.3	5.34	14.3	19 21.2	2 40.1	− 9 51.7	+0.5608	0.6051	0.0861	+77	+ 8
B. A. C. 1143	6.0	5.38	14.2	20 37.0	2 55.1	− 9 37.2	−0.6757	0.6051	0.0856	− 1	−66
B. A. C. 1242	6.3	5.36	12.2	19 55.4	9 20.9	− 3 27.1	+0.5171	0.6052	0.0702	+73	+ 7
ω^2 Tauri	5.7	+5.37	+10.1	+20 20.1	15 34.5	+ 2 31.5	+0.4957	0.6048	+0.0549	+71	+ 7
51 Tauri	6.0	5.42	9.9	21 20.3	15 59.3	+ 2 55.2	−0.4852	0.6047	0.0539	+10	−49
53 Tauri	6.0	5.40	9.8	20 54.2	16 24.2	+ 3 19.2	−0.0279	0.6047	0.0529	+36	−21
56 Tauri	6.0	5.42	9.7	21 32.0	16 27.7	+ 3 22.5	−0.6572	0.6047	0.0528	− 1	−63
χ^1 Tauri	4.7	5.44	8.9	22 4.1	18 40.4	+ 5 29.9	−1.0818	0.6043	0.0473	−31	−68
χ^2 Tauri	6.3	+5.44	+ 8.9	+21 58.4	18 41.7	+ 5 31.1	−0.9867	0.6043	+0.0473	−23	−68
B. A. C. 1373	6.0	5.41	8.7	21 23.6	19 42.5	+ 6 29.4	−0.3642	0.6042	0.0447	+17	−40
W. 4^h 650	6.0	5.36	7.5	20 29.2	23 41.9	+10 19.2	+0.7122	0.6034	0.0349	+90	+21
ι Tauri	5.0	5.36	4.1	21 26.9	8 9 21.1	− 4 24.8	−0.0342	0.6007	0.0111	+35	−18
105 Tauri	6.0	5.36	3.5	21 34.4	11 14.7	− 2 35.7	−0.1444	0.5999	+0.0064	+29	−24
108 Tauri	6.3	+5.36	+ 2.4	+22 10.3	14 11.3	+ 0 14.4	−0.7426	0.5988	−0.0007	− 6	−68
n Tauri	5.7	5.35	1.9	21 59.6	15 42.1	+ 1 41.1	−0.5668	0.5981	0.0044	+ 5	−52
o Tauri	6.0	5.32	+ 0.9	21 51.1	19 0.7	+ 4 51.9	−0.4513	0.5966	0.0123	+12	−44
ζ Tauri	3.3	5.26	− 0.2	21 4.9	23 0.2	+ 8 42.0	+0.2648	0.5947	0.0218	+54	− 3
χ^1 Orionis	4.7	5.16	2.2	20 15.4	9 5 45.0	− 8 48.9	+0.9100	0.5909	0.0374	+90	+33
NEPTUNE				+22 12.0	8 24.5	− 6 15.5	−1.1887	0.5902	−0.0434	−43	−68
χ^4 Orionis	5.0	+5.13	− 3.3	20 8.4	9 36.7	− 5 6.0	+0.8709	0.5887	0.0461	+90	+30
68 Orionis	6.0	5.09	4.2	19 48.7	12 55.7	− 1 54.6	+1.0456	0.5866	0.0534	+90	+42
16 Geminorum	6.8	5.05	6.3	20 33.3	19 29.4	+ 4 24.3	−0.1156	0.5822	0.0673	+31	−27
ν Geminorum	4.2	5.04	6.4	20 16.4	19 55.1	+ 4 49.1	+0.1458	0.5819	0.0683	+46	−13
f Geminorum	6.0	+4.59	−13.4	+17 53.9	11 2 27.9	+10 16.1	−0.3485	0.5596	−0.1238	+18	−47
1 Cancri	6.3	4.43	14.5	16 3.2	10 28.3	− 5 59.8	+0.5643	0.5530	0.1357	+76	+ 2
5 Cancri	6.3	4.42	15.1	16 43.6	12 32.5	− 3 59.7	−0.4341	0.5515	0.1385	+13	−55
29 Cancri	6.0	4.20	16.7	14 32.2	12 1 20.2	+ 8 22.9	+0.0205	0.5422	0.1546	+38	−30
A^1 Cancri	6.0	4.08	17.3	13 2.1	8 23.9	− 8 46.9	+0.5135	0.5374	0.1623	+71	− 4
A^2 Cancri	6.0	+4.04	−17.4	+12 28.3	10 13.7	− 7 0.6	+0.8202	0.5364	−0.1642	+90	+13
60 Cancri	6.0	3.97	17.8	12 0.2	14 39.1	− 2 43.5	+0.5913	0.5334	0.1681	+78	− 1
α^2 Cancri	4.0	3.97	18.1	12 14.4	15 54.8	− 1 30.1	+0.1230	0.5327	0.1696	+44	−26
κ Cancri	5.1	3.89	18.2	11 3.9	20 32.7	+ 2 59.3	+0.5973	0.5299	0.1737	+79	− 1
ω Leonis	5.9	3.74	18.9	9 29.2	13 7 2.6	−10 49.9	+0.4452	0.5242	0.1817	+65	−10
h Leonis	5.7	+3.71	−19.3	+10 9.1	8 50.0	− 9 5.7	−0.6040	0.5234	−0.1829	+ 4	−73
14 Sextantis	6.6	3.46	19.4	6 5.6	14 3 2.3	+ 8 34.6	+0.4027	0.5155	0.1926	+62	−14
19 Sextantis	6.2	3.41	19.2	5 6.2	6 14.1	+11 40.9	+0.8718	0.5144	0.1939	+90	+12
34 Sextantis	6.7	3.24	19.6	4 6.0	22 13.1	+ 3 12.6	−1.1631	0.5103	0.1983	−33	−86
36 Sextantis	6.6	3.22	19.3	3 0.5	23 35.4	+ 4 32.7	−0.2318	0.5101	0.1985	+25	−50
55 Leonis	6.2	+3.17	−18.9	+ 1 15.9	15 5 18.2	+10 5.8	+0.5570	0.5092	−0.1993	+74	− 7

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.		Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ									
		s	"	° ′	d	h m	h m				°	°
p^2 Leonis	5.4	+3.12	−18.8	+ 0 31.9	**15**	9 36.2	− 9 43.4	+0.5093	0.5087	−0.1996	+70	−10
p^5 Leonis	5.7	3.07	18.9	+ 0 28.1		15 7.5	− 4 21.3	−0.5232	0.5083	0.1996	+ 9	−70
e Leonis	5.3	3.00	18.0	− 2 27.4	**16**	0 8.8	+ 4 24.9	+0.9186	0.5082	0.1990	+88	+14
B. A. C. 4006	6.1	2.91	17.3	4 46.9		11 25.7	− 8 37.0	+1.2642	0.5083	0.1968	+85	+43
χ Virginis	5.2	2.75	15.8	7 27.0	**17**	13 24.9	− 7 21.8	−0.7688	0.5142	0.1861	− 7	−90
ψ Virginis	5.2	+2.72	−15.1	− 9 0.0		21 25.4	+ 0 24.9	−0.5203	0.5167	−0.1812	+ 7	−70
g Virginis	5.9	2.70	14.4	10 12.6	**18**	4 32.2	+ 7 19.4	−0.4505	0.5193	0.1761	+10	−66
i Virginis	5.7	2.66	−13.3	12 11.5		14 18.9	− 7 10.9	+0.0607	0.5232	0.1680	+36	−34
				NEW	*MOON.*							
JUPITER				−22 28.8	**23**	0 6.7	− 0 49.5	+1.1285	0.5569	−0.0023	+68	+36
ξ Ophiuchi	5.1	+2.86	+ 1.6	21 0.3		4 35.1	+ 3 29.7	−0.4525	0.5676	+0.0058	− 4	−67
52 Ophiuchi	6.5	2.89	2.6	21 58.6		10 51.8	+ 9 33.1	+0.6666	0.5670	0.0188	+61	+ 1
B. A. C. 5954	6.8	2.90	2.9	21 51.2		12 22.6	+11 0.7	+0.5652	0.5685	0.0219	+53	− 5
58 Ophiuchi	5.4	2.90	3.3	21 38.0		14 26.2	−11 0.0	+0.3797	0.5686	0.0262	+40	−16
B. A. C. 6098	6.0	+2.92	+ 4.9	−20 44.1		22 51.2	− 2 52.9	−0.2873	0.5689	+0.0434	+ 3	−55
μ Sagittarii	4.1	2.96	5.7	21 5.0	**24**	3 43.5	+ 1 49.1	+0.3195	0.5689	0.0534	+38	−19
14 Sagittarii	6.0	2.97	5.6	21 44.3		3 55.9	+ 2 1.0	+1.0279	0.5689	0.0538	+68	+26
15 Sagittarii	5.8	2.95	5.9	20 45.4		4 22.0	+ 2 26.3	+0.0057	0.5689	0.0547	+23	−35
16 Sagittarii	6.6	2.95	5.9	20 25.0		4 22.4	+ 2 26.6	−0.3561	0.5689	0.0547	+ 1	−60
21 Sagittarii	5.1	+2.97	+ 6.6	−20 35.6		8 48.5	+ 6 43.3	+0.0948	0.5687	+0.0636	+26	−32
B. A. C. 6347	6.0	3.02	7.4	21 8.0		14 44.1	−11 33.6	+1.0783	0.5682	0.0752	+69	+30
29 Sagittarii	5.5	3.04	8.5	20 26.2		19 28.6	− 6 59.1	+0.7180	0.5677	0.0846	+69	+ 4
Lalande 34597	6.4	3.05	9.7	19 23.3	**25**	1 23.3	− 1 17.0	+0.1415	0.5668	0.0959	+32	−29
B. A. C. 6536	5.8	3.07	10.1	19 26.6		3 41.1	+ 0 56.0	+0.4259	0.5662	0.1001	+50	−13
d Sagittarii	5.0	+3.09	+10.8	−19 7.7		7 49.3	+ 4 45.5	+0.5220	0.5658	+0.1078	+57	− 8
ρ^1 Sagittarii	4.2	3.08	11.4	18 2.0		9 37.7	+ 6 40.1	−0.4348	0.5655	0.1111	+ 2	−65
ρ^2 Sagittarii	6.5	3.08	11.2	18 29.4		9 41.5	+ 6 43.8	+0.0547	0.5655	0.1118	+28	−34
B. A. C. 6710	5.8	3.13	12.3	18 27.0		16 26.3	−10 45.6	+0.8021	0.5641	0.1230	+72	+ 9
e^1 Sagittarii	5.5	3.11	12.9	16 31.1		18 6.0	− 9 9.3	−1.0206	0.5638	0.1259	−32	−90
e^2 Sagittarii	5.4	+3.11	+13.2	−16 21.3		18 54.1	− 8 22.9	−1.0913	0.5635	+0.1272	−34	−90
g Sagittarii	5.3	3.15	14.4	15 45.2	**26**	1 47.8	− 1 43.5	−0.8032	0.5622	0.1386	−16	−90
B. A. C. 6992	5.7	3.22	16.1	15 5.7		12 3.1	+ 8 10.6	+0.0149	0.5599	0.1543	+31	−36
β Capricorni	3.2	3.22	16.1	15 5.6		12 9.5	+ 8 16.8	+0.0283	0.5599	0.1545	+32	−36
B. A. C. 7087	6.3	3.25	17.3	14 3.6		18 7.3	− 9 57.6	−0.1014	0.5586	0.1629	+27	−43
8 Aquarii	6.8	+3.33	+18.9	−13 26.1	**27**	5 49.2	+ 1 20.4	+1.2431	0.5562	+0.1779	+77	+33
ν Aquarii	4.7	3.36	19.9	11 46.3		10 15.3	+ 5 37.5	+0.3186	0.5555	0.1830	+52	−20
17 Aquarii	6.2	3.38	21.2	9 44.4		16 23.5	+11 33.2	−0.6368	0.5545	0.1897	0	−82
19 Aquarii	5.8	3.40	21.1	10 10.1		17 25.9	−11 46.4	+0.0034	0.5544	0.1906	+36	−35
ξ Aquarii	4.8	3.44	22.4	8 17.8		23 12.1	− 5 51.9	−0.8092	0.5537	0.1960	−10	−90
B. A. C. 7562	5.5	+3.48	+22.3	− 9 29.4	**28**	2 29.5	+ 2 41.1	+1.0682	0.5534	+0.1989	+81	+25
c^1 Capricorni	5.5	3.48	22.3	9 32.1		2 31.7	− 2 39.0	+1.1223	0.5534	0.1989	+80	+30
30 Aquarii	5.8	3.54	23.8	6 59.9		10 57.8	+ 5 30.2	+0.2223	0.5529	0.2054	+49	−25
B. A. C. 7744	6.7	3.56	24.7	5 12.4		15 20.6	+ 9 44.2	−0.7069	0.5528	0.2082	− 2	−90
B. A. C. 7752	6.7	3.58	24.9	4 56.4		15 21.8	+10 14.3	−0.8713	0.5527	0.2085	−12	−90
51 Aquarii	5.8	+3.62	+25.0	− 5 20.2		20 34.9	− 9 12.0	+0.5243	0.5528	+0.2112	+70	− 9
κ Aquarii	5.2	3.68	25.4	4 44.2	**29**	2 52.3	− 3 7.3	+1.2490	0.5533	0.2141	+85	+42
Lalande 44337	6.3	3.70	25.8	4 4.0		4 16.0	− 1 46.4	+0.8636	0.5533	0.2146	+86	+11
3 Piscium	6.4	3.79	27.3	− 0 20.6		13 23.2	+ 7 2.6	−0.9508	0.5541	0.2171	−16	−90
κ Piscium	4.7	3.94	27.7	+ 0 42.9	**30**	1 23.2	− 5 22.0	+0.5912	0.5567	0.2181	+77	− 5
9 Piscium	6.6	+3.94	+27.7	+ 0 34.8		1 31.8	− 5 13.6	+0.7590	0.5568	+0.2181	+90	+ 4
16 Piscium	5.8	3.98	28.1	1 33.3		5 40.9	− 1 13.1	+0.6782	0.5579	0.2178	+86	0
19 Piscium	4.9	+4.05	+28.3	+ 2 56.4		10 11.7	+ 3 8.5	+0.2611	0.5582	+0.2169	+52	−23

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	°
d Piscium	5.3	+4.28	+29.1	+ 7 38.6	1 1 26.6	− 6 8.3	−1.2018	0.5646	+0.2109	−37	−82
27 Arietis	6.3	5.23	22.6	17 16.1	8 8 22.9	− 1 12.8	−0.7132	0.5914	0.1454	− 3	−73
36 Arietis	6.5	5.30	21.3	17 20.8	13 46.3	+ 3 58.2	−0.0351	0.5938	0.1354	+35	−29
40 Arietis	6.3	5.34	21.0	17 52.4	15 27.1	+ 5 35.0	−0.3358	0.5945	0.1320	+19	−46
π Arietis	5.7	5.31	20.8	17 3.3	15 45.9	+ 5 53.1	+0.5227	0.5946	0.1315	+72	+ 1
ρ^2 Arietis	6.0	+5.37	+20.2	+17 55.9	18 21.1	+ 8 22.2	−0.0227	0.5957	+0.1264	+35	−28
ρ^3 Arietis	6.0	5.38	19.9	17 37.8	18 35.6	+ 8 36.2	+0.3120	0.5958	0.1259	+56	−10
50 Arietis	6.8	5.38	19.5	17 36.8	20 38.5	+10 34.3	+0.5827	0.5966	0.1217	+78	+ 6
53 Arietis	6.3	5.40	18.8	17 30.0	22 58.1	−11 11.6	+0.9743	0.5975	0.1169	+90	+31
54 Arietis	6.3	5.44	18.9	18 25.0	23 19.1	−10 51.5	+0.0986	0.5976	0.1162	+42	−20
δ Arietis	4.0	+5.50	+18.7	+19 27.2	4 0 35.9	− 9 37.7	−0.6910	0.5981	+0.1135	− 2	−70
13 Tauri	5.7	5.60	14.9	19 23.0	12 39.2	+ 1 57.0	+0.4883	0.6016	0.0868	+71	+ 4
14 Tauri	6.3	5.62	14.7	19 21.2	13 13.4	+ 2 29.8	+0.5683	0.6017	0.0855	+77	+ 8
B. A. C. 1143	6.0	5.66	14.7	20 37.0	13 28.5	+ 2 44.3	−0.6765	0.6017	0.0849	− 1	−67
B. A. C. 1242	6.3	5.69	12.5	19 55.4	19 58.4	+ 8 58.6	+0.5225	0.6029	0.0697	+73	+ 8
ω^2 Tauri	5.7	+5.74	+10.3	+20 20.1	5 2 14.8	− 9 0.0	+0.4995	0.6034	+0.0546	+71	+ 8
51 Tauri	6.0	5.79	10.3	21 20.3	2 39.9	− 8 36.0	−0.4852	0.6035	0.0537	+10	−49
53 Tauri	6.0	5.77	10.1	20 54.2	3 5.0	− 8 11.8	−0.0261	0.6035	0.0527	+36	−21
56 Tauri	6.0	5.80	10.1	21 32.1	3 8.4	− 8 8.6	−0.6579	0.6035	0.0525	0	−63
χ^1 Tauri	4.7	5.84	9.3	22 4.1	5 21.8	− 6 0.5	−1.0838	0.6035	0.0471	−31	−68
χ^2 Tauri	6.3	+5.84	+ 9.3	+21 58.4	5 23.1	− 5 59.3	−0.9884	0.6035	+0.0471	−23	−68
B. A. C. 1373	6.0	5.82	8.9	21 24.0	6 24.2	− 5 0.6	−0.3638	0.6035	0.0446	+17	−40
W. iv^h 650	6.0	5.78	7.5	20 29.2	10 24.3	− 1 10.2	+0.7151	0.6034	0.0348	+90	+22
ι Tauri	5.0	5.86	4.0	21 26.9	20 3.7	+ 8 6.1	−0.0336	0.6032	0.0111	+35	−18
l Tauri	5.7	5.81	3.4	20 17.3	21 55.6	+ 9 53.5	+1.1576	0.6017	0.0065	+90	+56
105 Tauri	6.0	+5.86	+ 3.4	+21 34.4	21 56.9	+ 9 54.8	−0.1438	0.6017	+0.0064	+29	−24
108 Tauri	6.3	5.89	2.3	22 10.3	6 0 53.4	−11 15.8	−0.7418	0.6010	−0.0008	− 6	−68
η Tauri	5.7	5.88	1.7	21 59.6	2 23.4	− 9 49.4	−0.5659	0.6006	0.0044	+ 5	−51
o Tauri	6.0	5.88	+ 0.6	21 51.1	5 40.8	− 6 39.8	−0.4507	0.5995	0.0124	+12	−43
ζ Tauri	3.3	5.84	− 0.8	21 4.9	9 38.9	− 2 51.1	+0.2649	0.5980	0.0219	+54	− 2
χ^1 Orionis	4.7	+5.77	− 3.1	+20 15.4	16 19.8	+ 3 34.1	+0.9076	0.5952	−0.0377	+90	+33
NEPTUNE				22 11.2	17 48.6	+ 4 59.3	−1.1216	0.5957	0.0411	−35	−68
χ^4 Orionis	5.0	5.76	4.4	20 8.4	20 8.9	+ 7 14.3	+0.8683	0.5934	0.0463	+90	+30
68 Orionis	6.0	5.74	5.5	19 48.7	23 25.4	+10 23.2	+1.0419	0.5917	0.0538	+90	+42
16 Geminorum	6.8	5.73	7.7	20 33.3	7 5 53.7	− 7 23.3	−0.1137	0.5880	0.0680	+31	−27
ν Geminorum	4.2	+5.72	− 7.8	+20 16.4	6 19.0	− 6 59.0	+0.1463	0.5877	−0.0689	+46	−13
f Geminorum	6.0	5.39	16.3	17 53.9	8 12 17.0	− 2 6.7	−0.3405	0.5799	0.1254	+18	−47
1 Cancri	6.3	5.25	17.8	16 3.2	20 6.7	+ 5 26.7	+0.5660	0.5607	0.1374	+76	+ 2
3 Cancri	6.0	5.28	18.6	17 34.6	21 47.8	+ 7 4.3	−1.2718	0.5595	0.1398	−52	−72
5 Cancri	6.3	5.25	18.5	16 43.5	22 8.1	+ 7 23.9	−0.4230	0.5592	0.1403	+14	−53
29 Cancri	6.0	+5.05	−20.6	+14 32.2	9 10 38.1	− 4 31.3	+0.0300	0.5498	−0.1566	+39	−29
A^1 Cancri	6.0	4.94	21.5	13 2.0	17 32.0	+ 2 9.1	+0.5199	0.5449	0.1644	+71	− 4
A^2 Cancri	6.0	4.90	21.7	12 28.2	19 19.3	+ 3 52.9	+0.5240	0.5436	0.1662	+90	+14
60 Cancri	6.0	4.84	22.3	12 0.1	23 38.6	+ 8 3.9	+0.5985	0.5406	0.1705	+79	0
a^2 Cancri	4.0	4.84	22.6	12 14.3	10 0 52.6	+ 9 15.6	+0.1372	0.5398	0.1717	+45	−25
κ Cancri	5.1	+4.76	−22.9	+11 3.9	5 24.3	−10 21.2	+0.6057	0.5367	−0.1757	+79	0
ω Leonis	5.9	4.61	23.8	9 29.1	15 40.6	− 0 24.0	+0.4550	0.5305	0.1837	+66	−10
h Leonis	5.7	4.60	24.2	10 9.0	17 25.9	+ 1 18.1	−0.5815	0.5294	0.1848	+ 6	−72
14 Sextantis	6.6	4.35	24.7	6 5.5	11 11 17.5	− 5 22.4	+0.4208	0.5203	0.1942	+63	−13
19 Sextantis	6.2	4.30	24.6	5 6.1	14 26.1	− 2 19.3	+0.8871	0.5190	0.1954	+90	+13
34 Sextantis	6.7	+4.12	−25.2	+ 4 5.9	12 6 11.0	−11 1.7	−1.1296	0.5135	−0.1993	−30	−86
36 Sextantis	6.6	4.10	24.9	3 0.4	7 32.4	− 9 42.6	−0.2046	0.5131	0.1995	+26	−49
55 Leonis	6.2	4.05	24.4	1 15.8	13 11.0	− 4 13.6	+0.5811	0.5118	0.2001	+76	− 6
p^2 Leonis	5.4	3.99	24.3	0 31.8	17 26.5	− 0 5.3	+0.5341	0.5108	0.2002	+72	− 8
p^5 Leonis	5.7	3.94	24.4	+ 0 28.1	22 54.7	+ 5 13.7	−0.4917	0.5100	0.2002	+11	−68
e Leonis	5.3	+3.86	−23.4	− 2 27.5	18 7 52.1	−10 4.1	+0.9444	0.5092	−0.1992	+88	+16

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1900.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
B. A. C. 4006	5.1	+3.76	−22.5	− 4 47.0	13 19 5.6	+ 0 50.5	+1.2911	0.5091	−0.1968	+85	+47
χ Virginis	5.2	3.56	20.5	7 27.1	14 21 3.0	+ 2 4.0	−0.7349	0.5127	0.1856	− 4	−90
ψ Virginis	5.2	3.51	19.5	8 0.1	15 5 4.4	+ 9 52.6	−0.4878	0.5149	0.1806	+ 8	−68
g Virginis	5.9	3.47	18.6	10 12.7	12 12.2	− 7 12.9	−0.4187	0.5172	0.1755	+11	−63
i Virginis	5.7	3.43	17.1	12 11.4	22 0.6	+ 2 18.4	+0.0878	0.5210	0.1674	+38	−32
B. A. C. 4700	5.6	+3.36	−13.7	−15 50.0	16 20 24.2	+ 0 1.7	+0.6029	0.5312	−0.1444	+68	− 4
B. A. C. 4896	6.6	3.27	10.8	17 22.6	17 16 18.9	− 4 40.9	−0.3284	0.5417	0.1184	+ 9	−58
10 Libræ	6.5	3.28	10.5	17 56.8	16 26.2	− 4 33.8	+0.2785	0.5418	0.1182	+43	−22
ι^1 Libræ	5.0	3.26	8.8	19 24.9	18 2 6.4	+ 4 47.6	+0.8113	0.5470	0.1036	+71	+10
ι^2 Libræ	6.5	3.26	8.8	19 16.4	2 37.6	+ 5 17.8	+0.6019	0.5473	0.1028	+63	− 3
B. A. C. 5109	6.2	+3.22	− 7.3	−19 19.9	11 38.1	− 9 58.5	−0.1959	0.5521	−0.0881	+13	−49
41 Libræ	5.9	3.21	7.0	18 58.5	14 32.8	− 7 10.6	−0.8301	0.5536	0.0831	−23	−90
κ Libræ	5.5	3.20	6.6	19 21.4	15 56.7	− 5 49.5	−0.5322	0.5543	0.0807	− 6	−74
λ Libræ	4.4	3.20	5.7	19 52.2	21 9.7	− 0 47.0	−0.3715	0.5569	0.0715	+ 2	−61
β^1 Scorpii	2.9	3.17	4.8	19 32.0	19 2 38.7	+ 4 30.9	−1.0995	0.5595	0.0614	−45	−90
ω^1 Scorpii	4.6	+3.19	− 4.5	−20 24.0	3 14.9	+ 5 5.8	−0.1983	0.5598	−0.0603	+10	−49
ω^2 Scorpii	4.6	3.20	− 4.5	20 36.0	3 30.8	+ 5 21.3	+0.0024	0.5599	−0.0600	+22	−37
				NEW	*MOON.*						
Lalande 35497	6.4	3.07	+ 9.6	19 23.3	22 8 1.6	+ 7 8.9	+0.0968	0.5736	+0.0963	+29	−32
B. A. C. 6536	5.8	+3.08	+10.0	−19 26.5	10 16.7	+ 9 19.2	+0.3775	0.5732	+0.1007	+46	−16
d Sagittarii	5.0	3.07	10.9	19 7.7	14 19.9	−10 46.3	+0.4697	0.5726	0.1084	+53	−11
ρ^1 Sagittarii	4.2	3.06	11.1	18 2.0	16 6.1	− 9 4.0	−0.4808	0.5723	0.1117	0	−69
ρ^2 Sagittarii	6.5	3.07	11.0	18 29.4	16 9.8	− 9 0.3	+0.0047	0.5723	0.1118	+25	−37
B. A. C. 6710	5.8	3.08	12.1	18 27.0	22 46.5	− 2 37.9	+0.7414	0.5710	0.1239	+70	+ 5
e^1 Sagittarii	5.5	+3.05	+12.6	−16 31.1	23 0 24.1	− 1 3.7	−1.0680	0.5707	+0.1267	−36	−90
e^2 Sagittarii	5.4	3.05	12.7	16 21.3	1 11.3	− 0 18.2	−1.1039	0.5706	0.1281	−39	−90
g Sagittarii	5.3	3.06	13.9	15 45.2	7 56.7	+ 6 12.8	−0.8582	0.5690	0.1396	−20	−90
B. A. C. 6992	5.7	3.08	15.5	15 5.8	18 0.3	− 8 4.8	−0.0533	0.5664	0.1554	+27	−40
β Capricorni	3.2	3.08	15.4	15 5.6	18 6.5	− 7 58.8	−0.0403	0.5664	0.1556	+28	−40
B. A. C. 7087	6.3	+3.08	+16.5	−14 3.6	23 57.8	− 2 19.8	−0.1733	0.5648	+0.1640	+22	−47
8 Aquarii	6.8	3.11	18.0	13 26.2	24 11 28.2	+ 8 46.8	+1.1564	0.5617	0.1790	+77	+34
ν Aquarii	4.7	3.14	18.8	11 46.3	15 50.3	−11 0.1	+0.2338	0.5606	0.1841	+47	−24
17 Aquarii	6.2	3.15	19.9	9 44.4	21 53.6	− 5 9.3	−0.7215	0.5591	0.1905	− 5	−90
19 Aquarii	5.8	3.16	19.8	10 10.1	22 55.2	− 4 9.7	−0.0846	0.5588	0.1915	+29	−42
ξ Aquarii	4.8	+3.19	+21.0	− 8 17.8	25 4 37.6	+ 1 21.0	−0.8980	0.5576	+0.1968	−16	−90
B. A. C. 7562	5.5	3.22	20.9	9 29.4	7 53.0	+ 4 29.7	+0.9723	0.5569	0.1996	+81	+18
c^1 Capricorni	5.5	3.22	20.9	9 32.2	7 55.3	+ 4 31.9	+1.0265	0.5569	0.1996	+80	+22
30 Aquarii	5.8	3.26	22.2	7 0.0	16 17.6	−11 22.7	+0.1247	0.5554	0.2058	+43	−30
B. A. C. 7744	6.7	3.28	23.0	5 12.4	20 38.9	− 7 10.2	−0.8062	0.5548	0.2085	− 8	−90
B. A. C. 7752	6.7	+3.30	+23.1	− 4 56.4	21 10.0	− 6 40.2	−0.9708	0.5547	+0.2088	−19	−90
51 Aquarii	5.8	3.34	23.2	5 20.2	26 1 52.2	− 2 7.4	+0.4226	0.5542	0.2113	+62	−15
κ Aquarii	5.2	3.38	23.6	4 44.2	8 9.3	+ 3 57.0	+1.1462	0.5537	0.2139	+85	+31
Lalande 44337	6.3	3.40	24.0	4 4.0	9 33.0	+ 5 18.0	+0.7630	0.5536	0.2144	+78	+ 4
3 Piscium	6.4	3.48	25.4	− 0 20.6	18 42.0	− 9 51.5	−1.0616	0.5534	0.2165	−24	−90
κ Piscium	4.7	+3.63	+25.7	+ 0 42.9	27 6 47.3	+ 1 49.5	+0.4842	0.5540	+0.2169	+68	−11
9 Piscium	6.6	3.63	25.7	0 34.8	6 56.1	+ 1 58.0	+0.6533	0.5541	0.2169	+83	− 2
16 Piscium	5.8	3.67	26.1	1 33.3	11 8.0	+ 6 1.4	+0.5749	0.5546	0.2163	+75	− 6
19 Piscium	4.9	3.74	26.4	2 56.4	15 23.3	+10 26.5	+0.1520	0.5552	0.2153	+46	−29
27 Arietis	6.3	5.08	21.9	17 16.1	30 15 43.7	+ 7 55.6	−0.8055	0.5810	0.1436	− 9	−73
36 Arietis	6.5	+5.16	+21.0	+17 20.8	21 17.8	−10 42.7	−0.1132	0.5834	+0.1338	+31	−34
40 Arietis	6.3	5.20	20.6	17 52.4	23 1.9	− 9 2.5	−0.4169	0.5841	0.1306	+14	−52
π Arietis	5.7	5.18	20.3	17 3.3	23 21.3	− 8 43.9	+0.4545	0.5842	0.1300	+67	− 3
ρ^2 Arietis	6.0	5.25	19.8	17 55.9	31 2 1.7	− 6 9.5	−0.0939	0.5853	0.1250	+32	−32
ρ^3 Arietis	6.0	5.25	19.5	17 37.8	2 16.6	− 5 55.1	+0.2430	0.5856	0.1245	+52	−13
50 Arietis	6.8	+5.30	+19.0	+17 36.8	4 23.5	− 3 53.0	+0.5193	0.5863	+0.1205	+72	+ 2
53 Arietis	6.3	5.32	18.3	17 30.0	6 47.7	− 1 34.3	+0.9188	0.5872	0.1157	+90	+27
54 Arietis	6.3	5.36	18.4	18 25.0	7 9.5	− 1 13.3	+0.0310	0.5872	0.1150	+39	−24
δ Arietis	4.0	+5.43	+18.3	+19 27.2	8 28.7	+ 0 2.9	−0.7689	0.5878	+0.1124	− 7	−71

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1900.

Date.	The Star's		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
Jan. 8	104 Piscium	7.5	22 53	3 41	52	99	0 8	4 56	250	283	1 15
11	χ^1 Tauri	4.7	22 51	3 28	89	143	23 52	4 28	244	301	1 0
11	χ^2 Tauri	6.3	22 55	3 31	112	167	23 46	4 22	221	278	0 51
13	14 Geminorum	7.2	4 7	8 35	122	174	5 26	9 54	250	278	1 19
Feb. 2	19 Piscium *	4.9	7 25	10 34	105	56	8 4	11 12	218	172	0 38
4	104 Piscium *	7.5	9 10	12 10	47	354	9 51	12 52	288	236	0 42
5	27 Arietis	6.3	7 38	10 35	118	64	8 25	11 21	223	171	0 46
6	τ^2 Arietis	5.3	5 22	8 16	52	4	6 31	9 24	291	136	1 8
6	65 Arietis	6.0	6 23	9 16	50	356	7 23	10 16	298	242	1 0
7	χ^1 Tauri	4.7	8 43	11 32	94	37	9 47	12 36	272	217	1 4
7	χ^2 Tauri	6.3	8 47	11 36	115	58	9 47	12 35	251	196	0 59
11	5 Cancri	6.3	11 18	13 50	169	116	12 1	14 33	241	186	0 43
13	h Leonis	5.7	7 25	9 51	85	123	8 40	11 5	334	352	1 14
15	p^2 Leonis	5.4	9 56	12 13	139	157	11 23	13 40	291	284	1 27
16	B. A. C. 4006	6.1	13 18	15 31	162	138	14 24	16 37	262	226	1 6
17	q Virginis	5.7	11 25	13 34	152	168	12 42	14 51	275	272	1 17
21	δ Scorpii	2.6	16 57	18 49	37	23	17 43	19 35	335	212	0 46
22	15 Ophiuchi *	7.3	10 23	12 12	65	117	11 9	12 59	317	8	0 47
22	22 Ophiuchi	6.7	15 28	17 17	44	61	16 23	18 11	327	333	0 54
24	31 Sagittarii	7.0	14 58	16 39	142	183	15 37	17 18	209	245	0 39
Mar. 5	δ Arietis ‡	4.0	10 19	11 25	57	2	11 3	12 9	293	238	0 44
13	14 Sextantis	6.6	12 3	12 38	167	132	13 2	13 36	258	214	0 58
14	36 Sextantis	6.6	6 39	7 11	51	99	7 9	7 40	5	51	0 29
14	55 Leonis	6.2	15 6	15 36	88	40	16 4	16 34	323	272	0 58
14	57 Leonis	6.9	15 37	16 8	141	90	16 36	17 6	269	218	0 58
23	SATURN		13 36	13 31	100	147	14 43	14 38	260	200	1 7
Apr. 5	15 Geminorum	7.0	6 49	5 54	182	167	7 5	6 10	202	178	0 16
11	ϵ Leonis *	5.3	18 29	17 8	94	45	19 20	17 59	304	257	0 51
14	85 Virginis	6.5	18 13	16 40	181	134	18 29	16 57	208	160	0 17
22	8 Aquarii	6.8	15 49	13 47	31	80	16 36	14 32	297	343	0 45
May 5	60 Cancri *	6.0	16 20	13 25	142	90	17 2	14 7	256	205	0 42
9	B. A. C. 4006	6.1	14 26	11 16	124	88	15 44	12 33	290	244	1 17
10	q Virginis	5.7	12 33	9 19	140	138	13 58	10 44	283	261	1 25
15	24 Ophiuchi	5.9	15 47	12 14	82	96	17 14	13 40	285	279	1 26
17	ξ^1 Sagittarii	5.7	19 28	15 46	27	21	20 26	16 43	300	282	0 57
19	τ^2 Capricorni *	5.6	14 0	10 11	145	195	14 22	10 33	192	244	0 22
20	B. A. C. 7562	5.5	20 5	16 11	68	91	21 25	17 30	233	236	1 19
20	c^1 Capricorni	5.5	20 6	16 12	79	102	21 22	17 28	222	227	1 16
22	κ Piscium	4.7	17 54	13 52	43	94	18 48	14 46	269	318	0 54
22	9 Piscium	6.6	17 54	13 52	76	127	18 52	14 50	235	284	0 58
26	36 Arietis *	6.5	10 12	5 55	152	101	10 27	6 11	189	138	0 16
June 1	29 Cancri	6.0	12 48	8 8	56	3	13 22	8 41	351	298	0 33
4	57 Leonis *	6.9	18 22	13 29	69	20	19 1	14 8	329	282	0 39
5	e Leonis	5.3	11 50	6 54	101	86	13 13	8 16	225	191	1 22
13	B. A. C. 6336	6.2	20 20	14 51	41	18	21 24	15 55	286	252	1 4
14	B. A. C. 6707	6.4	20 19	14 46	63	52	21 36	16 4	253	226	1 18
17	51 Aquarii	5.8	21 58	16 14	5	11	22 47	17 2	290	297	0 48
22	ρ^2 Arietis	6.0	21 3	14 59	85	138	21 59	15 54	236	291	0 55
July 9	Piazzi 17^h 334	5.3	15 40	8 30	149	182	16 21	9 10	208	235	0 40
10	SATURN		17 57	10 43	74	75	19 20	12 5	267	251	1 22
13	8 Aquarii	6.8	16 6	8 40	36	84	16 56	9 30	291	335	0 50
19	36 Arietis	6.5	23 57	16 7	96	146	1 4	17 13	218	256	1 6

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.
* Whole occultation below the horizon of Washington. † Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1900.

Date.	The Star's		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
July 23	16 Geminorum †	6.8	22 12	14 6	98	154	23 1	14 55	262	318	0 49
31	*q* Virginis *	5.7	19 7	10 30	181	131	19 23	10 46	212	163	0 16
Aug. 7	B. A. C. 6336	6.2	17 46	8 41	37	48	18 48	9 43	302	299	1 2
8	B. A. C. 6707	6.4	17 18	8 10	42	70	18 24	9 15	290	307	1 5
10	B. A. C. 7562	5.5	0 36	15 18	98	61	1 27	16 10	206	162	0 52
10	c^1 Capricorni	5.5	0 41	15 24	113	75	1 21	16 4	191	148	0 40
11	Lalande 44337	6.3	0 13	14 52	81	56	1 18	15 57	218	181	1 5
12	9 Piscium	6.6	18 57	9 32	8	57	19 30	10 6	301	348	0 34
12	16 Piscium	5.8	23 56	14 31	75	71	1 8	15 43	222	249	1 12
17	53 Tauri	6.0	22 38	12 53	66	120	23 37	13 52	268	324	0 59
26	*e* Leonis	5.3	16 37	6 18	142	92	17 30	7 11	262	206	0 53
Sept. 12	π Arietis *	5.7	18 36	7 10	43	97	19 15	7 49	286	340	0 39
12	ρ^1 Arietis	7.0	20 35	9 8	64	118	21 27	10 1	260	314	0 53
12	ρ^3 Arietis	6.0	21 24	9 57	26	80	22 4	10 37	296	350	0 40
12	50 Arietis	6.8	23 40	12 13	132	185	0 11	12 44	186	237	0 31
12	54 Arietis	6.3	3 28	16 0	75	62	4 49	17 21	256	213	1 21
13	B. A. C. 1242	6.3	23 47	12 16	153	209	0 0	12 29	176	232	0 13
14	ι Tauri	5.0	1 3	13 28	55	112	2 7	14 32	288	243	1 4
27	ι^1 Libræ ‡	5.0	19 19	6 54	69	25	20 21	7 56	300	250	1 2
Oct. 1	29 Sagittarii	5.5	21 14	8 32	17	348	21 56	9 15	308	271	0 43
5	Lalande 44337	6.3	1 41	12 44	121	81	2 15	13 17	184	140	0 33
6	9 Piscium	6.6	19 57	6 56	7	51	20 34	7 33	299	338	0 37
6	16 Piscium	5.8	1 2	12 1	79	53	2 10	13 8	223	184	1 7
6	19 Piscium *	4.9	6 19	17 17	27	336	6 55	17 52	295	245	0 35
10	13 Tauri	5.7	4 34	15 16	142	113	5 12	15 54	200	158	0 38
12	ζ Tauri	3.3	0 52	11 27	75	131	1 58	12 33	275	331	1 6
15	29 Cancri	6.0	5 44	16 7	76	123	6 56	17 18	324	357	1 11
26	URANUS		19 46	5 26	95	59	20 58	6 39	256	211	1 13
27	52 Ophiuchi	6.5	19 55	5 32	50	21	21 3	6 39	290	251	1 7
27	B. A. C. 5954 ‡	6.8	21 52	7 28	56	11	22 51	8 27	283	233	0 59
29	B. A. C. 6658	7.3	22 27	7 56	11	335	23 5	8 33	307	266	0 37
Nov. 6	ρ^1 Arietis	7.0	21 20	6 17	24	77	21 57	6 54	299	353	0 37
6	50 Arietis	6.8	0 3	9 0	86	137	1 12	10 9	234	274	1 9
6	54 Arietis	6.3	4 14	13 10	27	354	5 3	13 59	308	263	0 49
7	B. A. C. 1242	6.3	22 53	7 45	49	101	23 44	8 37	289	240	0 52
7	ω^2 Tauri	5.7	7 15	16 6	118	64	8 14	17 6	242	186	1 0
11	1 Cancri	6.3	0 4	8 41	126	180	1 54	9 31	249	301	0 50
12	60 Cancri	6.0	4 52	13 24	181	233	5 12	13 44	213	162	0 20
12	α^2 Cancri	4.0	5 51	14 23	66	114	6 48	15 21	337	18	0 58
25	*d* Sagittarii *	5.0	1 2	8 43	94	42	1 52	9 34	233	183	0 51
30	16 Piscium	5.8	21 7	4 30	47	84	22 20	5 43	253	274	1 13
30	19 Piscium	4.9	3 39	11 1	53	6	4 40	12 2	260	210	1 1
Dec. 3	π Arietis ‡	5.7	9 27	16 36	88	34	10 16	17 25	259	305	0 49
4	13 Tauri	5.7	5 55	13 1	122	73	6 53	13 58	227	173	0 57
4	14 Tauri	6.3	6 49	13 54	141	87	7 28	14 33	211	156	0 39
6	ζ Tauri	3.3	1 7	8 5	51	107	2 2	9 0	299	355	0 55
9	A^1 Cancri	6.0	11 11	17 56	87	42	12 14	18 59	325	274	1 3
10	ω Leonis	5.9	8 0	14 42	120	149	9 29	16 10	296	294	1 28
12	55 Leonis	6.2	5 2	11 37	175	226	5 30	12 4	228	279	0 27
12	p^3 Leonis	5.4	9 59	16 33	110	128	11 27	18 0	316	306	1 27
17	10 Libræ	6.5	8 16	14 30	78	129	9 6	15 20	319	10	0 49
27	κ Piscium	4.7	1 28	7 4	74	41	2 38	8 14	229	186	1 10
27	9 Piscium	6.6	1 43	7 19	115	79	2 25	8 1	189	148	0 42

NOTE.—The angles of position are counted from the north point and vertex of the moon's limb, toward the east.

* Whole occultation below the horizon of Washington. † Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.

FOR WASHINGTON MEAN NOON.

Date.	k	i	θ	L	Date.	k	i	θ	L
		°	°				°	°	
Jan. 1	0.778	56.2	187.0	36.2	July 5	0.393	102.3	15.9	31.6
6	0.840	47.1	182.4	31.4	10	0.308	112.5	19.3	28.8
11	0.885	39.6	177.4	28.2	15	0.221	124.0	23.1	24.5
16	0.919	33.1	171.9	26.3	20	0.133	137.2	28.3	17.7
21	0.945	27.2	165.8	25.6	25	0.057	152.3	38.6	8.9
26	0.966	21.2	158.7	26.1	30	0.014	166.5	75.6	2.4
31	0.983	15.1	149.0	27.7	Aug. 4	0.025	161.7	154.8	4.4
Feb. 5	0.994	8.6	129.2	30.8	9	0.102	142.7	177.8	16.9
10	0.998	5.2	52.9	35.9	14	0.240	121.4	186.5	35.4
15	0.986	13.4	359.2	43.4	19	0.424	98.7	192.5	54.0
20	0.946	26.8	345.3	53.7	24	0.629	75.0	198.1	66.9
25	0.856	44.5	338.7	64.9	29	0.809	51.8	204.1	68.8
Mar. 2	0.700	66.3	334.5	71.2	Sept. 3	0.928	31.1	211.2	61.2
7	0.491	91.0	331.3	64.5	8	0.984	14.4	223.5	50.5
12	0.276	116.6	327.6	44.5	13	0.999	4.3	293.4	41.2
17	0.107	141.9	321.1	19.8	18	0.991	11.0	7.4	34.5
22	0.016	165.3	298.9	3.2	23	0.972	19.2	18.1	30.2
27	0.014	166.5	185.6	2.6	28	0.948	26.3	21.7	27.6
Apr. 1	0.077	147.7	162.7	12.5	Oct. 3	0.920	32.8	23.2	26.4
6	0.172	131.0	157.0	22.6	8	0.888	39.1	23.6	26.3
11	0.271	117.3	154.3	28.6	13	0.851	45.4	23.5	27.4
16	0.363	106.0	152.7	31.3	18	0.803	52.7	22.2	29.6
21	0.446	96.2	151.8	32.5	23	0.742	61.1	21.0	33.1
26	0.523	87.4	151.3	33.4	28	0.660	71.4	19.4	38.0
May 1	0.597	78.8	151.3	34.8	Nov. 2	0.547	84.6	18.0	43.3
6	0.673	69.7	151.9	37.4	7	0.392	102.5	16.9	45.5
11	0.754	59.5	153.3	41.6	12	0.200	126.9	16.5	34.6
16	0.839	47.3	155.6	47.9	17	0.032	159.2	15.0	7.7
21	0.923	32.3	159.5	56.2	22	0.022	162.9	208.0	5.5
26	0.984	14.3	167.6	64.2	27	0.198	127.2	204.3	38.4
31	0.997	6.4	327.0	67.6	Dec. 2	0.427	98.4	202.6	55.6
June 5	0.948	26.5	345.9	63.8	7	0.612	77.0	200.2	52.7
10	0.857	44.5	353.1	55.7	12	0.741	61.2	197.0	44.4
15	0.754	59.5	359.0	47.6	17	0.826	49.3	193.2	37.0
20	0.654	72.0	4.1	41.4	22	0.883	40.0	188.7	31.6
25	0.562	82.9	8.5	37.1	27	0.922	32.4	183.5	28.0
30	0.477	92.6	12.4	34.1	32	0.950	25.9	177.5	25.9

NOTATION.

k, the ratio of the illuminated portion of the apparent disk to the entire apparent disk considered as the superfices of a circle.

i, the angle between the sun and earth, as seen from the planet.

θ, the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L, the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR WASHINGTON MEAN NOON.

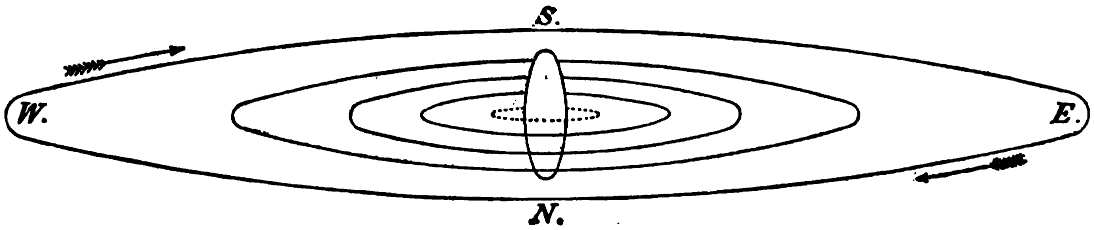
Date.	k	i	θ	L	Date.	k	i	θ	L
		°	°				°	°	
Jan. 1	0.899	37.0	348.5	58.2	July 8	0.003	173.8	101.2	3.3
6	0.890	38.7	346.5	59.4	10	0.005	171.8	133.2	8.5
11	0.881	40.5	344.6	60.8	12	0.011	168.3	148.6	16.8
16	0.870	42.3	343.0	62.3	14	0.018	164.5	156.4	28.7
21	0.859	44.1	341.5	63.9	16	0.028	160.5	160.8	43.7
26	0.847	45.9	340.2	65.6	18	0.040	156.7	163.9	60.0
31	0.834	47.9	339.3	67.4	20	0.055	152.8	166.1	77.8
Feb. 5	0.821	49.7	338.5	69.4	22	0.071	149.1	167.7	95.3
10	0.809	51.6	337.9	71.6	24	0.087	145.5	169.1	112.5
15	0.797	53.5	337.5	74.0	26	0.106	142.1	170.3	127.8
20	0.783	55.5	337.3	76.5	28	0.122	138.8	171.3	141.6
25	0.768	57.5	337.4	79.2	30	0.141	135.7	172.2	153.2
Mar. 2	0.752	59.7	337.6	82.2	Aug. 1	0.160	132.7	173.1	162.9
7	0.736	61.9	338.0	85.4	3	0.178	129.8	173.9	171.0
12	0.718	64.1	338.7	88.9	5	0.198	127.2	174.7	177.2
17	0.701	66.3	339.7	92.6	7	0.216	124.6	175.5	181.8
22	0.683	68.6	340.9	96.7	9	0.235	122.1	176.3	185.0
27	0.662	71.1	342.2	101.0	14	0.278	116.4	178.3	188.0
Apr. 1	0.641	73.6	343.7	105.9	19	0.319	111.3	180.4	185.4
6	0.619	76.2	345.3	111.1	24	0.355	106.8	182.5	179.4
11	0.597	78.8	347.1	116.8	29	0.390	102.6	184.7	172.0
16	0.573	81.6	348.9	122.8	Sept. 3	0.424	98.7	186.9	164.4
21	0.546	84.7	351.0	129.3	8	0.455	95.1	189.0	156.4
26	0.519	87.8	353.0	136.6	13	0.483	91.9	191.1	148.2
May 1	0.491	91.0	355.0	144.3	18	0.511	88.8	193.3	140.1
6	0.461	94.4	357.0	152.3	23	0.537	85.8	195.3	132.9
11	0.429	98.2	358.9	160.4	28	0.562	82.9	197.2	126.4
16	0.395	102.1	0.6	168.3	Oct. 3	0.586	80.1	198.9	120.3
21	0.359	106.4	2.3	176.0	8	0.609	77.4	200.4	114.7
26	0.321	111.0	3.9	181.9	13	0.631	74.9	201.8	109.3
31	0.280	116.1	5.3	184.9	18	0.651	72.5	203.0	104.3
June 5	0.236	121.8	6.6	182.3	23	0.670	70.1	203.9	99.8
10	0.189	128.4	7.5	172.3	28	0.690	67.8	204.6	95.6
12	0.170	131.2	7.9	165.4	Nov. 2	0.708	65.5	205.1	91.9
14	0.152	134.1	8.5	156.8	7	0.725	63.3	205.3	88.3
16	0.133	137.1	9.1	146.0	12	0.742	61.1	205.2	85.0
18	0.114	140.4	9.7	132.9	17	0.759	58.9	204.9	82.0
20	0.095	143.8	10.4	118.2	22	0.774	56.8	204.3	79.2
22	0.078	147.4	11.3	102.3	27	0.789	54.8	203.4	76.4
24	0.062	151.1	12.5	85.1	Dec. 2	0.803	52.8	202.2	74.0
26	0.048	154.9	14.1	67.8	7	0.816	50.8	200.8	71.7
28	0.034	158.8	16.5	50.6	12	0.829	48.8	199.1	69.6
30	0.022	162.7	20.0	35.1	17	0.842	46.8	197.2	67.6
July 2	0.015	166.6	25.7	21.8	22	0.853	44.9	195.0	65.7
4	0.008	170.3	36.7	11.5	27	0.864	43.1	192.6	63.9
6	0.004	173.1	61.2	4.5	32	0.875	41.3	190.0	62.2

MARS not being in opposition during the year 1900, the satellites will not be visible.

APPARENT DISK OF MARS, 1900.

January	1,	1.000
January	31,	0.999
March	2,	0.995
April	1,	0.989
May	1,	0.980
May	31,	0.969
June	30,	0.955
July	30,	0.941
August	29,	0.926
September	28,	0.910
October	28,	0.900
November	27,	0.901
December	27,	0.923

The numbers in this table are the versed sines of the illuminated disk, the apparent diameter of the planet being taken as unity.



APPARENT ORBITS OF THE SATELLITES OF JUPITER IN 1900,
AS SEEN IN AN INVERTING TELESCOPE.

(*The vertical scale is three times the horizontal one.*)

The object of this figure is to facilitate the identification of the satellites in cases where the diagrams of configurations do not suffice for that purpose. If two satellites are seen together reference to the above diagram may enable one to identify the inner and outer satellite of the pair. The central, vertical ellipse represents the disk of Jupiter, elongated three times in the vertical direction. The dotted line represents the orbit of Satellite V.

Facing each page of the phenomena of Jupiter's satellites, pages 480—500, is the page of diagrams of configurations for the same month. The light disks ○ in the vertical row in the middle of the page represent the relative position of Jupiter each day. The dots adjacent in the same horizontal space represent the positions of the several satellites on the same day, at the hour and minute of Washington mean time indicated above the diagrams. The latitudes of the satellites are always considered zero in constructing the diagrams, except where two or more satellites chance to be at nearly the same distance from the planet, when they are placed one above the other according to their apparent latitudes. The numerals designating the satellites are placed on the right or left hand side of the dot, according as the motion of the satellite, at the time of the configuration, is toward the east or toward the west—the motion being always toward the numeral. Sometimes, at the epoch of the configuration, one or more satellites will be projected on the disk of the planet: this phenomenon is indicated by a light disk ○ at the left hand side of the page. Frequently, also, one or more satellites will be invisible, being concealed in occultation behind the disk, or eclipsed in the shadow of the planet: this phenomenon is indicated by a dark disk ● at the right hand side of the page. In both cases, the annexed numeral serves to point out which satellite is thus rendered invisible.

When an observation is made at a different hour from that for which the diagram is constructed, the motion of the satellite during the interval may be judged by transferring its given position to the above diagram, and estimating its motion during the elapsed interval by means of the following table of the periods;—

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s		d
I.	1	18	28	35.945	=	1.76986048
II.	3	13	17	53.735	=	3.55409416
III.	7	3	59	35.854	=	7.16638720
IV.	16	18	5	6.928	=	16.75355241
V.	0	11	57	27.635	=	0.49823652

SATELLITE V.

WASHINGTON MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION.

	d	h			d	h			d	h			d	h	
March	8	11.4	E.	June	6	15.2	E.	March	8	17.4	W.	June	6	9.3	W.
	18	10.6	E.		16	14.3	E.		18	16.5	W.		16	8.3	W.
	28	9.7	E.		26	13.4	E.		28	15.7	W.		26	7.4	W.
April	7	8.8	E.	July	6	12.5	E.	April	7	14.8	W.	July	6	6.6	W.
	17	7.9	E.		16	11.7	E.		17	13.8	W.		16	17.6	W.
	27	7.0	E.		26	10.8	E.		27	12.9	W.		26	16.8	W.
May	7	18.0	E.	Aug.	5	10.0	E.	May	7	12.0	W.	Aug.	5	15.9	W.
	17	17.1	E.		15	9.1	E.		17	11.1	W.		15	15.1	W.
	27	16.2	E.		25	8.3	E.		27	10.2	W.		25	14.3	W.

WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

		h	m			h	m			h	m			h	m
Jan.	2	1	49.2	March	22	17	29.1	June	10	7	17.3	Aug.	28	21	49.6
	3	20	19.2		24	11	56.5		12	1	43.4		30	16	18.4
	5	14	49.1		26	6	24.1		13	20	9.5	Sept.	1	10	47.4
	7	9	19.0		28	0	51.3		15	14	35.6		3	5	16.4
	9	3	48.7		29	19	18.6		17	9	1.8		4	23	45.4
	10	22	18.5		31	13	45.8		19	3	28.1		6	18	14.4
	12	16	48.1	April	2	8	13.1		20	21	54.5		8	12	43.6
	14	11	17.9		4	2	40.1		22	16	20.8		10	7	12.8
	16	5	47.4		5	21	7.2		24	10	47.1		12	1	42.1
	18	0	17.1		7	15	34.2		26	5	13.5		13	20	11.4
	19	18	46.6		9	10	1.1		27	23	40.1		15	14	40.7
	21	13	16.2		11	4	27.9		29	18	6.7		17	9	10.2
	23	7	45.5		12	22	54.8	July	1	12	33.3		19	3	39.7
	25	2	15.1		14	17	21.5		3	7	0.0		20	22	9.2
	26	20	44.4		16	11	48.2		5	1	26.8		22	16	38.7
	28	15	14.0		18	6	14.8		6	19	53.5		24	11	8.3
	30	9	43.1		20	0	41.3		8	14	20.4		26	5	37.9
Feb.	1	4	12.5		21	19	7.6		10	8	47.5		28	0	7.6
	2	22	41.6		23	13	34.2		12	3	14.5		29	18	37.2
	4	17	10.9		25	8	0.5		13	21	41.4	Oct.	1	13	6.9
	6	11	39.9		27	2	26.9		15	16	8.7		3	7	36.6
	8	6	9.1		28	20	53.1		17	10	35.8		5	2	6.5
	10	0	38.1		30	15	19.4		19	5	3.1		6	20	36.3
	11	19	7.1	May	2	9	45.5		20	23	30.4		8	15	6.2
	13	13	35.9		4	4	11.6		22	17	57.9		10	9	36.0
	15	8	4.8		5	22	37.8		24	12	25.4		12	4	5.9
	17	2	33.5		7	17	3.9		26	6	53.1		13	22	35.9
	18	21	2.4		9	11	29.9		28	1	20.6		15	17	6.0
	20	15	30.9		11	5	56.1		29	19	48.4		17	11	35.9
	22	9	59.6		13	0	22.1		31	14	16.1		19	6	6.0
	24	4	28.1		14	18	48.1	Aug.	2	8	44.0		21	0	36.1
	25	22	56.6		16	13	14.1		4	3	11.8		22	19	6.2
	27	17	25.0		18	7	40.0		5	21	39.9		24	13	36.2
March	1	11	53.5		20	2	5.9		7	16	7.9		26	8	6.5
	3	6	21.7		21	20	31.9		9	10	36.1		28	2	36.6
	5	0	50.1		23	14	57.8		11	5	4.2		29	21	6.7
	6	19	18.2		25	9	23.7		12	23	32.5		31	15	36.9
	8	13	46.4		27	3	49.6		14	18	0.7	Nov.	2	10	7.2
	10	8	14.5		28	22	15.5		16	12	29.3		4	4	37.4
	12	2	42.6		30	16	41.4		18	6	57.6		5	23	7.8
	13	21	10.4	June	1	11	7.3		20	1	26.2		7	17	38.1
	15	15	38.2		3	5	33.1		21	19	54.7		9	12	8.5
	17	10	6.1		4	23	59.1		23	14	23.4		11	6	38.8
	19	4	33.9		6	18	25.1		25	8	52.1		13	1	9.1
	20	23	1.4		8	12	51.2		27	3	20.8		14	19	39.4
													16	14	9.8

WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

		h m			h m			h m			h m
Jan.	1	5 16.2	March	23	23 23.2	June	13	13 56.8	Sept.	3	6 21.8
	4	18 38.6		27	12 36.7		17	3 4.9		6	19 42.7
	8	8 0.6		31	1 49.3		20	16 14.4		10	9 3.0
	11	21 22.4	April	3	15 1.7		24	5 23.1		13	22 24.9
	15	10 43.7		7	4 13.3		27	18 33.4		17	11 46.1
	19	0 5.0		10	17 24.7	July	1	7 43.2		21	1 8.6
	22	13 26.1		14	6 35.3		4	20 54.4		24	14 30.5
	26	2 46.7		17	19 45.9		8	10 5.1		28	3 53.6
	29	16 6.9		21	8 55.5		11	23 17.3	Oct.	1	17 16.2
Feb.	2	5 27.0		24	22 5.1		15	12 29.2		5	6 39.8
	5	18 46.7		28	11 14.0		19	1 42.6		8	20 2.8
	9	8 5.9	May	2	0 23.0		22	14 55.5		12	9 27.1
	12	21 24.7		5	13 31.1		26	4 10.1		15	22 50.6
	16	10 43.1		9	2 39.5		29	17 24.3		19	12 15.3
	20	0 1.3		12	15 47.0	Aug.	2	6 40.1		23	1 39.2
	23	13 19.0		16	4 55.1		5	19 55.4		26	15 4.1
	27	2 36.0		19	18 2.4		9	9 12.4		30	4 28.4
March	2	15 52.7		23	7 10.2		12	22 28.9	Nov.	2	17 53.4
	6	5 9.1		26	20 17.4		16	11 46.9		6	7 18.1
	9	18 25.0		30	9 25.4		20	1 4.5		9	20 43.4
	13	7 40.2	June	2	22 32.6		23	14 23.6		13	10 8.1
	16	20 55.0		6	11 40.6		27	3 42.1		16	23 33.5
	20	10 9.4		10	0 48.2		30	17 2.3			

SATELLITE III.

		h m			h m			h m			h m
Jan.	1	6 45.1	March	21	3 57.0	June	7	17 40.8	Aug.	25	9 27.3
	8	11 6.1		28	7 40.6		14	20 59.2	Sept.	1	13 29.7
	15	15 24.9	April	4	11 19.6		22	0 20.1		8	17 35.1
	22	19 41.6		11	14 53.7		29	3 44.6		15	21 43.8
	29	23 56.1		18	18 23.4	July	6	7 12.4		23	1 55.9
Feb.	6	4 7.0		25	21 49.3		13	10 44.5		30	6 10.8
	13	8 15.5	May	3	1 11.9		20	14 20.3	Oct.	7	10 29.1
	20	12 19.9		10	4 32.4		27	18 0.5		14	14 49.2
	27	16 20.3		17	7 50.4	Aug.	3	21 45.3		21	19 11.6
March	6	20 16.6		24	11 7.6		11	1 34.8		28	23 35.2
	14	0 8.7		31	14 23.9		18	5 29.1	Nov.	5	4 0.1
										12	8 26.6

SATELLITE IV.

		h m			h m			h m			h m
Jan.	16	23 48.3	April	10	17 14.9	July	2	18 30.6	Sept.	24	9 30.0
Feb.	2	19 14.2		27	8 31.1		19	10 7.6	Oct.	11	5 8.1
	19	14 1.0	May	13	23 5.4	Aug.	5	2 40.7		28	1 14.2
March	8	8 1.1		30	13 20.0		21	20 8.2	Nov.	13	21 40.9
	25	1 6.5	June	16	3 40.7	Sept.	7	14 26.8			

WASHINGTON MEAN TIME.

JANUARY.

d	h	m	s			
1	2	33	56.5	II.	Ec.	Dis.
	2	41		I.	Sh.	In.
	2	48	37.0	III.	Ec.	Dis.
	3	28		I.	Tr.	In.
	4	16	27.4	III.	Ec.	Re.
	4	53		I.	Sh.	Eg.
	5	41		I.	Tr.	Eg.
	5	50		III.	Oc.	Dis.
	6	29		II.	Oc.	Re.
	7	41		III.	Oc.	Re.
	23	57	0.6	I.	Ec.	Dis.
2	2	56		I.	Oc.	Re.
	21	9		II.	Sh.	In.
	21	9		I.	Sh.	In.
	21	58		I.	Tr.	In.
	22	45		II.	Tr.	In.
	23	21		I.	Sh.	Eg.
	23	33		II.	Sh.	Eg.
3	0	10		I.	Tr.	Eg.
	1	10		II.	Tr.	Eg.
	18	25	32.1	I.*	Ec.	Dis.
	21	26		I.	Oc.	Re.
4	15	37		I.	Sh.	In.
	15	50	25.2	II.	Ec.	Dis.
	16	27		I.	Tr.	In.
	16	29		III.	Sh.	In.
	17	49		I.*	Sh.	Eg.
	18	13		III.*	Sh.	Eg.
	18	40		I.*	Tr.	Eg.
	19	50		III.	Tr.	In.
	19	51		II.	Oc.	Re.
	21	41		III.	Tr.	Eg.
5	12	53	56.5	I.	Ec.	Dis.
	15	55		I.	Oc.	Re.
6	10	6		I.	Sh.	In.
	10	28		II.	Sh.	In.
	10	57		I.	Tr.	In.
	12	9		II.	Tr.	In.
	12	18		I.	Sh.	Eg.
	12	50		II.	Sh.	Eg.
	13	10		I.	Tr.	Eg.
	14	34		II.	Tr.	Eg.
7	7	22	26.5	I.	Ec.	Dis.
	10	25		I.	Oc.	Re.
8	4	34		I.	Sh.	In.
	5	6	52.6	II.	Ec.	Dis.
	5	27		I.	Tr.	In.
	6	46		I.	Sh.	Eg.
	6	46	8.0	III.	Ec.	Dis.
	7	39		I.	Tr.	Eg.
	8	14	31.1	III.	Ec.	Re.
	9	13		II.	Oc.	Re.
	10	11		III.	Oc.	Dis.
	12	1		III.	Oc.	Re.
9	1	50	48.3	I.	Ec.	Dis.
	4	55		I.	Oc.	Re.
	23	2		I.	Sh.	In.
	23	46		II.	Sh.	In.
	23	56		I.	Tr.	In.
10	1	14		I.	Sh.	Eg.
	1	32		II.	Tr.	In.
	2	8		II.	Sh.	Eg.
	2	9		I.	Tr.	Eg.
	3	57		II.	Tr.	Eg.
	20	19	17.6	I.	Ec.	Dis.
	23	25		I.	Oc.	Re.
11	17	30		I.*	Sh.	In.
	18	23	20.1	II.*	Ec.	Dis.
	18	26		I.*	Tr.	In.
	19	43		I.	Sh.	Eg.
	20	27		III.	Sh.	In.
	20	39		I.	Tr.	Eg.
	22	12		III.	Sh.	Eg.
	22	35		II.	Oc.	Re.
12	0	11		III.	Tr.	In.
	2	0		III.	Tr.	Eg.
	14	47	41.0	I.	Ec.	Dis.
	17	54		I.*	Oc.	Re.
13	11	59		I.	Sh.	In.
	12	56		I.	Tr.	In.
	13	5		II.	Sh.	In.
	14	11		I.	Sh.	Eg.
	14	56		II.	Tr.	In.
	15	8		I.	Tr.	Eg.
	15	27		II.	Sh.	Eg.
	17	21		II.*	Tr.	Eg.
14	9	16	10.2	I.	Ec.	Dis.
	12	24		I.	Oc.	Re.
15	6	27		I.	Sh.	In.
	7	25		I.	Tr.	In.
	7	39	45.8	II.	Ec.	Dis.
	8	39		I.	Sh.	Eg.
	9	38		I.	Tr.	Eg.
	10	43	31.3	III.	Ec.	Dis.
	11	56		II.	Oc.	Re.
	12	12	30.1	III.	Ec.	Re.
	14	30		III.	Oc.	Dis.
	16	19		III.*	Oc.	Re.
16	3	44	31.0	I.	Ec.	Dis.
	6	54		I.	Oc.	Re.
17	0	55		I.	Sh.	In.
	1	55		I.	Tr.	In.
	2	23		II.	Sh.	In.
	3	8		I.	Sh.	Eg.
	4	7		I.	Tr.	Eg.
	4	19		II.	Tr.	In.
	4	45		II.	Sh.	Eg.
	6	44		II.	Tr.	Eg.
	22	12	59.4	I.	Ec.	Dis.
18	1	23		I.	Oc.	Re.
	19	24		I.	Sh.	In.
	20	24		I.	Tr.	In.
	20	56	12.1	II.	Ec.	Dis.
	21	36		I.	Sh.	Eg.
	22	37		I.	Tr.	Eg.
19	0	24		III.	Sh.	In.
	1	17		II.	Oc.	Re.
	2	9		III.	Sh.	Eg.
	4	29		III.	Tr.	In.
	6	17		III.	Tr.	Eg.
	16	41	22.1	I.*	Ec.	Dis.
	19	53		I.	Oc.	Re.
20	13	52		I.	Sh.	In.
	14	54		I.	Tr.	In.
	15	41		II.	Sh.	In.
	16	4		I.*	Sh.	Eg.
	17	6		I.*	Tr.	Eg.
	17	42		II.*	Tr.	In.
	18	3		II.*	Sh.	Eg.
	20	6		II.	Tr.	Eg.
21	11	9	50.4	I.	Ec.	Dis.
21	14	23		I.	Oc.	Re.
22	8	20		I.	Sh.	In.
	9	23		I.	Tr.	In.
	10	12	36.6	II.	Ec.	Dis.
	10	32		I.	Sh.	Eg.
	11	35		I.	Tr.	Eg.
	14	39		II.	Oc.	Re.
	14	40	57.7	III.	Ec.	Dis.
	16	10	35.1	III.*	Ec.	Re.
	18	48		III.*	Oc.	Dis.
	20	35		III.	Oc.	Re.
23	5	38	10.6	I.	Ec.	Dis.
	8	52		I.	Oc.	Re.
24	2	48		I.	Sh.	In.
	3	52		I.	Tr.	In.
	4	58		II.	Sh.	In.
	5	1		I.	Sh.	Eg.
	6	5		I.	Tr.	Eg.
	7	4		II.	Tr.	In.
	7	21		II.	Sh.	Eg.
	9	29		II.	Tr.	Eg.
25	0	6	37.8	I.	Ec.	Dis.
	3	21		I.	Oc.	Re.
	21	17		I.	Sh.	In.
	22	21		I.	Tr.	In.
	23	29		I.	Sh.	Eg.
	23	29	2.3	II.	Ec.	Dis.
26	0	34		I.	Tr.	Eg.
	3	59		II.	Oc.	Re.
	4	20		III.	Sh.	In.
	6	6		III.	Sh.	Eg.
	8	44		III.	Tr.	In.
	10	31		III.	Tr.	Eg.
	18	34	59.6	I.	Ec.	Dis.
	21	51		I.	Oc.	Re.
27	15	45		I.*	Sh.	In.
	16	51		I.*	Tr.	In.
	17	57		I.*	Sh.	Eg.
	18	16		II.*	Sh.	In.
	19	3		I.	Tr.	Eg.
	20	25		II.	Tr.	In.
	20	39		II.	Sh.	Eg.
	22	51		II.	Tr.	Eg.
28	13	3	27.2	I.	Ec.	Dis.
	16	20		I.*	Oc.	Re.
29	10	13		I.	Sh.	In.
	11	20		I.	Tr.	In.
	12	25		I.	Sh.	Eg.
	12	45	26.3	II.	Ec.	Dis.
	13	32		I.	Tr.	Eg.
	17	19		II.*	Oc.	Re.
	18	38	55.8	III.*	Ec.	Dis.
	20	9	13.8	III.	Ec.	Re.
	23	3		III.	Oc.	Dis.
30	0	50		III.	Oc.	Re.
	7	31	46.6	I.	Ec.	Dis.
	10	50		I.	Oc.	Re.
31	4	41		I.	Sh.	In.
	5	49		I.	Tr.	In.
	6	54		I.	Sh.	Eg.
	7	34		II.	Sh.	In.
	8	2		I.	Tr.	Eg.
	9	47		II.	Tr.	In.
	9	57		II.	Sh.	Eg.
	12	12		II.	Tr.	Eg.

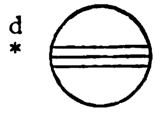
Note.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

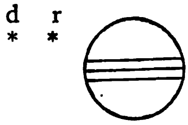
JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

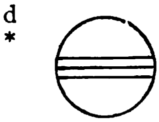
I.



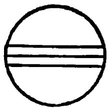
III.



II.



IV. No Eclipse.



Configurations at 17ʰ 30ᵐ for an Inverting Telescope.

Day.	West.		East.
1	·1	○	·3 ·2 ·4
2		○	1· 2· ·3 ·4
3	2· ·1	○	3· ·4
4	○1·	○	3· 4· ·2●
5	3·	○	·1 2· 4·
6	·3 1· 2·	○	4·
7	·3 ·2	○	·1 4·
8	·1 4·	○	·3 ·2
9	4·	○	1· 2· ·3
10	4· 2· ·1	○	3·
11	4· ·2	○	1· 3·
12	4· 3·	○	·2 ·1●
13	·4 3· 1· 2·	○	
14	·4 ·3 ·2	○	·1
15	·4 1·	○	·3 ·2
16	·4	○	1· 2· ·3
17	2· ·1	○	·4 3·
18	·2	○	1· 3· ·4
19	3· ·1	○	·2 ·4
20	○2· 3· 1·	○	·4
21	·3 ·2	○	·1 4·
22	1· ·3	○	·2 4·
23		○	·1 2· ·3 4·
24	2··1	○	4· 3·
25	·2 4·	○	1· 3·
26	4· 3· ·1	○	·2
27	○1· 4· 3·	○	2·
28	4· ·3 2·	○	·1
29	·4 1··3	○	·2●
30	·4	○	·1 2· ·3
31	·4 1· 2·	○	·3

WASHINGTON MEAN TIME.

FEBRUARY.

d	h	m	s			
1	2	0	15.2	I.	Ec.	Dis.
	5	19		I.	Oc.	Re.
	23	10		I.	Sh.	In.
2	0	18		I.	Tr.	In.
	1	22		I.	Sh.	Eg.
	2	1	52.1	II.	Ec.	Dis.
	2	31		I.	Tr.	Eg.
	6	40		II.	Oc.	Re.
	8	17		III.	Sh.	In.
	10	4		III.	Sh.	Eg.
	12	56		III.	Tr.	In.
	14	43		III.	Tr.	Eg.
	20	28	34.2	I.	Ec.	Dis.
	23	48		I.	Oc.	Re.
3	17	38		I.*	Sh.	In.
	18	47		I.	Tr.	In.
	19	50		I.	Sh.	Eg.
	20	52		II.	Sh.	In.
	20	59		I.	Tr.	Eg.
	23	8		II.	Tr.	In.
	23	14		II.	Sh.	Eg.
4	1	32		II.	Tr.	Eg.
	14	57	1.0	I.	Ec.	Dis.
	18	17		I.*	Oc.	Re.
5	12	6		I.	Sh.	In.
	13	16		I.	Tr.	In.
	14	18		I.	Sh.	Eg.
	15	18	16.6	II.*	Ec.	Dis.
	15	28		I.*	Tr.	Eg.
	19	59		II.	Oc.	Re.
	22	36	30.3	III.	Ec.	Dis.
6	0	7	30.7	III.	Ec.	Re.
	3	14		III.	Oc.	Dis.
	5	0		III.	Oc.	Re.
	9	25	19.7	I.	Ec.	Dis.
	12	46		I.	Oc.	Re.
7	6	34		I.	Sh.	In.
	7	45		I.	Tr.	In.
	8	46		I.	Sh.	Eg.
	9	57		I.	Tr.	Eg.
	10	9		II.	Sh.	In.
	12	29		II.	Tr.	In.
	12	33		II.	Sh.	Eg.
	14	54		II.*	Tr.	Eg.
8	3	53	45.3	I.	Ec.	Dis.
	7	15		I.	Oc.	Re.
9	1	2		I.	Sh.	In.
	2	14		I.	Tr.	In.
	3	15		I.	Sh.	Eg.
	4	26		I.	Tr.	Eg.
	4	34	43.2	II.	Ec.	Dis.
	9	18		II.	Oc.	Re.
	12	15		III.	Sh.	In.
	14	2		III.	Sh.	Eg.
	17	5		III.*	Tr.	In.
	18	51		III.	Tr.	Eg.
	22	22	5.7	I.	Ec.	Dis.
10	1	44		I.	Oc.	Re.
	19	31		I.	Sh.	In.
	20	43		I.	Tr.	In.
	21	43		I.	Sh.	Eg.
	22	55		I.	Tr.	Eg.

d	h	m	s			
10	23	27		II.	Sh.	In.
11	1	49		II.	Tr.	In.
	1	51		II.	Sh.	Eg.
	4	14		II.	Tr.	Eg.
	16	50	32.1	I.*	Ec.	Dis.
	20	13		I.	Oc.	Re.
12	13	59		I.	Sh.	In.
	15	12		I.*	Tr.	In.
	16	11		I.*	Sh.	Eg.
	17	24		I.*	Tr.	Eg.
	17	51	9.0	II.*	Ec.	Dis.
	20	10	6.7	II.	Ec.	Re.
	20	12		II.	Oc.	Dis.
	22	37		II.	Oc.	Re.
13	2	34	24.3	III.	Ec.	Dis.
	4	6	9.3	III.	Ec.	Re.
	7	23		III.	Oc.	Dis.
	9	8		III.	Oc.	Re.
	11	18	50.3	I.	Ec.	Dis.
	14	42		I.*	Oc.	Re.
14	8	27		I.	Sh.	In.
	9	40		I.	Tr.	In.
	10	39		I.	Sh.	Eg.
	11	53		I.	Tr.	Eg.
	12	45		II.	Sh.	In.
	15	9		II.*	Sh.	Eg.
	15	9		II.*	Tr.	In.
	17	34		II.*	Tr.	Eg.
15	5	47	15.3	I.	Ec.	Dis.
	9	11		I.	Oc.	Re.
16	2	55		I.	Sh.	In.
	4	9		I.	Tr.	In.
	5	8		I.	Sh.	Eg.
	6	21		I.	Tr.	Eg.
	7	7	36.5	II.	Ec.	Dis.
	9	26	42.1	II.	Ec.	Re.
	9	31		II.	Oc.	Dis.
	11	56		II.	Oc.	Re,
	16	13		III.*	Sh.	In.
	18	0		III.*	Sh.	Eg.
	21	13		III.	Tr.	In.
	22	57		III.	Tr.	Eg.
17	0	15	35.2	I.	Ec.	Dis.
	3	40		I.	Oc.	Re.
	21	24		I.	Sh.	In.
	22	38		I.	Tr.	In.
	23	36		I.	Sh.	Eg.
18	0	50		I.	Tr.	Eg.
	2	2		II.	Sh.	In.
	4	26		II.	Sh.	Eg.
	4	28		II.	Tr.	In.
	6	53		II.	Tr.	Eg.
	18	44	0.7	I.	Ec.	Dis.
	22	9		I.	Oc.	Re.
19	15	52		I.*	Sh.	In.
	17	6		I.*	Tr.	In.
	18	4		I.*	Sh.	Eg.
	19	19		I.	Tr.	Eg.
	20	24	4.4	II	Ec.	Dis.
	22	43	19.8	II.	Ec.	Re.
	22	49		II.	Oc.	Dis.
20	1	14		II.	Oc.	Re.

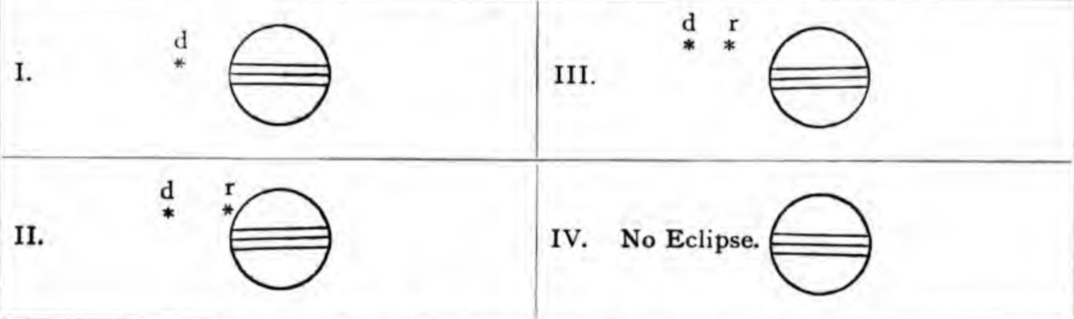
d	h	m	s			
20	6	31	39.0	III.	Ec.	Dis
	8	4	10.6	III.	Ec.	Re.
	11	28		III.	Oc.	Dis.
	13	12		III.	Oc.	Re.
	13	12	18.6	I.	Ec.	Dis.
	16	37		I.*	Oc.	Re.
21	10	26		I.	Sh.	In.
	11	35		I.	Tr.	In.
	12	32		I.	Sh.	Eg.
	13	47		I.	Tr.	Eg.
	15	20		II.*	Sh.	In.
	17	44		II.*	Sh.	Eg.
	17	47		II.*	Tr.	In.
	20	13		II.	Tr.	Eg.
22	7	40	43.0	I.	Ec.	Dis
	11	6		I.	Oc.	Re.
23	4	48		I.	Sh.	In.
	6	3		I.	Tr.	In.
	7	1		I.	Sh.	Eg.
	8	16		I.	Tr.	Eg.
	9	40	34.0	II.	Ec.	Dis.
	11	59	58.1	II.	Ec.	Re.
	12	6		II.	Oc.	Dis.
	14	32		II.*	Oc.	Re.
	20	10		III.	Sh.	In.
	21	58		III.	Sh.	Eg.
24	1	16		III.	Tr.	In.
	2	9	2.3	I.	Ec.	Dis.
	2	59		III.	Tr.	Eg.
	5	34		I.	Oc.	Re.
	23	17		I.	Sh.	In.
25	0	32		I.	Tr.	In.
	1	29		I.	Sh.	Eg.
	2	44		I.	Tr.	Eg.
	4	38		II.	Sh.	In.
	7	2		II.	Sh.	Eg.
	7	6		II.	Tr.	In.
	9	31		II.	Tr.	Eg.
	20	37	27.5	I.	Ec.	Dis.
26	0	3		I.	Oc.	Re.
	17	45		I.*	Sh.	In.
	19	0		I.	Tr.	In.
	19	57		I.	Sh.	Eg.
	21	12		I.	Tr.	Eg.
	22	57	4.7	II.	Ec.	Dis.
27	1	16	37.7	II.	Ec.	Re.
	1	24		II.	Oc.	Dis.
	3	49		II.	Oc.	Re.
	10	28	44.0	III.	Ec.	Dis.
	12	2	3.7	III.	Ec.	Re.
	15	5	45.0	I.*	Ec.	Dis.
	15	29		III.*	Oc.	Dis.
	17	12		III.*	Oc.	Re.
	18	31		I.	Oc.	Re.
28	12	13		I.	Sh.	In.
	13	28		I.	Tr.	In.
	14	25		I.*	Sh.	Eg.
	15	41		I.*	Tr.	Eg.
	17	55		II.*	Sh.	In.
	20	20		II.	Sh.	Eg.
	20	24		II.	Tr.	In.
	22	49		II.	Tr.	Eg.

Note.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

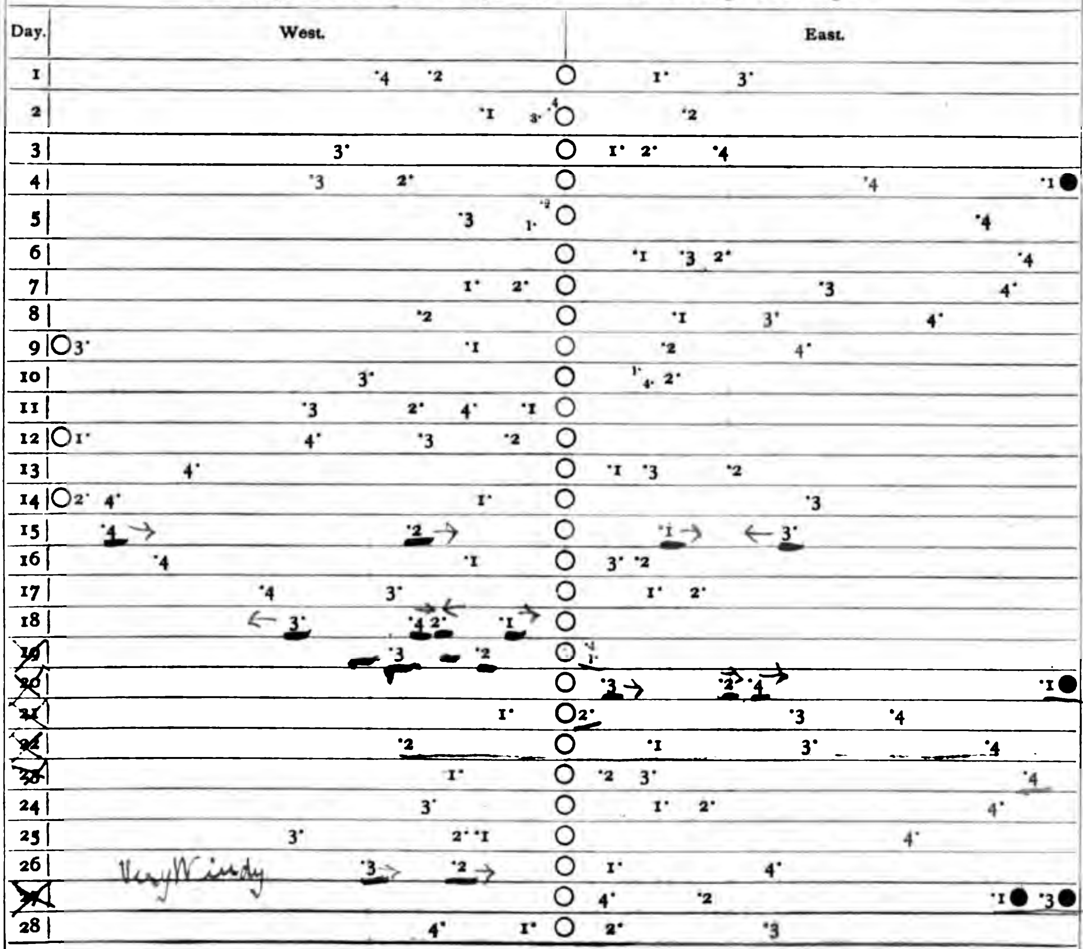
WASHINGTON MEAN TIME.

FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 16h 30m for an Inverting Telescope.



WASHINGTON MEAN TIME.

MARCH.

d	h	m	s			
1	9	34	8.7	I.	Ec.	Dis.
	13	0		I.	Oc.	Re.
2	6	41		I.	Sh.	In.
	7	57		I.	Tr.	In.
	8	54		I.	Sh.	Eg.
	10	9		I.	Tr.	Eg.
	12	13	36.3	II.	Ec.	Dis.
	14	33	18.7	II.*	Ec.	Re.
	14	40		II.*	Oc.	Dis.
	17	5		II.*	Oc.	Re.
3	0	7		III.	Sh.	In.
	1	56		III.	Sh.	Eg.
	4	2	27.7	I.	Ec.	Dis.
	5	15		III.	Tr.	In.
	6	57		III.	Tr.	Eg.
	7	28		I.	Oc.	Re.
4	1	10		I.	Sh.	In.
	2	25		I.	Tr.	In.
	3	22		I.	Sh.	Eg.
	4	37		I.	Tr.	Eg.
	7	13		II.	Sh.	In.
	9	37		II.	Sh.	Eg.
	9	41		II.	Tr.	In.
	12	6		II.	Tr.	Eg.
	22	30	52.8	I.	Ec.	Dis.
5	1	56		I.	Oc.	Re.
	19	38		I.	Sh.	In.
	20	53		I.	Tr.	In.
	21	50		I.	Sh.	Eg.
	23	5		I.	Tr.	Eg.
6	1	30	11.1	II.	Ec.	Dis.
	3	50	3.3	II.	Ec.	Re.
	3	57		II.	Oc.	Dis.
	6	22		II.	Oc.	Re.
	14	25	47.4	III.*	Ec.	Dis.
	15	59	56.8	III.*	Ec.	Re.
	16	59	10.2	I.*	Ec.	Dis.
	19	26		III.	Oc.	Dis.
	20	24		I.	Oc.	Re.
	21	7		III.	Oc.	Re.
7	14	6		I.*	Sh.	In.
	15	21		I.*	Tr.	In.
	16	18		I.*	Sh.	Eg.
	17	33		I.*	Tr.	Eg.
	20	30		II.	Sh.	In.
	22	55		II.	Sh.	Eg.
	22	58		II.	Tr.	In.
8	1	24		II.	Tr.	Eg.
	11	27	33.7	I.	Ec.	Dis.
	14	53		I.*	Oc.	Re.
9	8	34		I.	Sh.	In.
	9	49		I.	Tr.	In.
	10	47		I.	Sh.	Eg.
	12	1		I.	Tr.	Eg.
	14	46	45.2	II.*	Ec.	Dis.
	17	6	47.4	II.*	Ec.	Re.
	17	15		II.*	Oc.	Dis.
	19	38		II.	Oc.	Re.
10	4	4		III.	Sh.	In.
	5	54		III.	Sh.	Eg.
	5	55	52.6	I.	Ec.	Dis.
	9	9		III.	Tr.	In.
	9	21		I.	Oc.	Re.
	10	51		III.	Tr.	Eg.
11	3	2		I.	Sh.	In.
	4	17		I.	Tr.	In.
	5	15		I.	Sh.	Eg.
11	6	29		I.	Tr.	Eg.
	9	48		II.	Sh.	In.
	12	12		II.	Sh.	Eg.
	12	15		II.	Tr.	In.
	14	40		II.*	Tr.	Eg.
12	0	24	17.3	I.	Ec.	Dis.
	3	49		I.	Oc.	Re.
	21	31		I.	Sh.	In.
	22	45		I.	Tr.	In.
	23	43		I.	Sh.	Eg.
13	0	57		I.	Tr.	Eg.
	4	3	24.8	II.	Ec.	Dis.
	6	23	36.8	II.	Ec.	Re.
	6	28		II.	Oc.	Dis.
	8	53		II.	Oc.	Re.
	18	22	58.0	III.	Ec.	Dis.
	18	52	34.7	I.	Ec.	Dis.
	19	57	59.0	III.	Ec.	Re.
	22	17		I.	Oc.	Re.
	23	18		III.	Oc.	Dis.
14	0	59		III.	Oc.	Re.
	15	59		I.*	Sh.	In.
	17	13		I.*	Tr.	In.
	18	12		I.	Sh.	Eg.
	19	25		I.	Tr.	Eg.
	23	5		II.	Sh.	In.
15	1	30		II.	Sh.	Eg.
	1	31		II.	Tr.	In.
	3	56		II.	Tr.	Eg.
	13	20	58.1	I.*	Ec.	Dis.
	16	44		I.*	Oc.	Re.
16	10	27		I.	Sh.	In.
	11	40		I.	Tr.	In.
	12	40		I.	Sh.	Eg.
	13	53		I.*	Tr.	Eg.
	17	20	3.2	II.*	Ec.	Dis.
	19	40	23.2	II.	Ec.	Re.
	19	43		II.	Oc.	Dis.
	22	8		II.	Oc.	Re.
17	7	49	17.1	I.	Ec.	Dis.
	8	1		III.	Sh.	In.
	9	51		III.	Sh.	Eg.
	11	12		I.	Oc.	Re.
	12	59		III.*	Tr.	In.
	14	40		III.*	Tr.	Eg.
18	4	56		I.	Sh.	In.
	6	8		I.	Tr.	In.
	7	8		I.	Sh.	Eg.
	8	20		I.	Tr.	Eg.
	12	22		II.	Sh.	In.
	14	46		II.*	Tr.	In.
	14	47		II.*	Sh.	Eg.
	17	11		II.*	Tr.	Eg.
19	2	17	42.0	I.	Ec.	Dis.
	5	40		I.	Oc.	Re.
	23	24		I.	Sh.	In.
20	0	36		I.	Tr.	In.
	1	36		I.	Sh.	Eg.
	2	48		I.	Tr.	Eg.
	6	36	47.7	II.	Ec.	Dis.
	11	22		II.	Oc.	Re.
	20	45	59.7	I.	Ec.	Dis.
	22	20	45.2	III.	Ec.	Dis.
	23	56	40.2	III.	Ec.	Re.
21	0	8		I.	Oc.	Re.
	3	7		III.	Oc.	Dis.
	4	47		III.	Oc.	Re.
21	17	52		I.	Sh.	In.
	19	3		I.	Tr.	In.
	20	5		I.	Sh.	Eg.
	21	16		I.	Tr.	Eg.
22	1	40		II.	Sh.	In.
	4	1		II.	Tr.	In.
	4	5		II.	Sh.	Eg.
	6	26		II.	Tr.	Eg.
	15	14	23.0	I.*	Ec.	Dis.
	18	35		I.	Oc.	Re.
23	12	20		I.*	Sh.	In.
	13	31		I.*	Tr.	In.
	14	33		I.*	Sh.	Eg.
	15	43		I.*	Tr.	Eg.
	19	53	28.6	II.	Ec.	Dis.
24	0	36		II.	Oc.	Re.
	9	42	42.2	I.	Ec.	Dis.
	11	58		III.	Sh.	In.
	13	3		I.*	Oc.	Re.
	13	49		III.*	Sh.	Eg.
	16	45		III.*	Tr.	In.
	18	24		III.	Tr.	Eg.
25	6	49		I.	Sh.	In.
	7	58		I.	Tr.	In.
	9	1		I.	Sh.	Eg.
	10	10		I.	Tr.	Eg.
	14	57		II.*	Sh.	In.
	17	15		II.*	Tr.	In.
	17	22		II.	Sh.	Eg.
	19	40		II.	Tr.	Eg.
26	4	11	7.2	I.	Ec.	Dis.
	7	30		I.	Oc.	Re.
27	1	17		I.	Sh.	In.
	2	26		I.	Tr.	In.
	3	30		I.	Sh.	Eg.
	4	38		I.	Tr.	Eg.
	9	10	21.0	II.	Ec.	Dis.
	13	49		II.*	Oc.	Re.
	22	39	25.1	I.	Ec.	Dis.
28	1	57		I.	Oc.	Re.
	2	18	19.7	III.	Ec.	Dis.
	3	55	10.5	III.	Ec.	Re.
	6	51		III.	Oc.	Dis.
	8	30		III.	Oc.	Re.
	19	45		I.	Sh.	In.
	20	53		I.	Tr.	In.
	21	58		I.	Sh.	Eg.
	23	5		I.	Tr.	Eg.
29	4	14		II.	Sh.	In.
	6	29		II.	Tr.	In.
	6	40		II.	Sh.	Eg.
	8	54		II.	Tr.	Eg.
	17	7	48.7	I.*	Ec.	Dis.
	20	25		I.	Oc.	Re.
30	14	14		I.*	Sh.	In.
	15	20		I.*	Tr.	In.
	16	26		I.*	Sh.	Eg.
	17	32		I.	Tr.	Eg.
	22	27	6.2	II.	Ec.	Dis.
31	3	2		II.	Oc.	Re.
	11	36	8.2	I.	Ec.	Dis.
	14	52		I.*	Oc.	Re.
	15	56		III.*	Sh.	In.
	17	47		III.	Sh.	Eg.
	20	26		III.	Tr.	In.
	22	5		III.	Tr.	Eg.

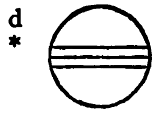
NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance, Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

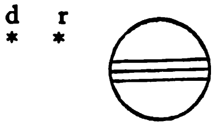
MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

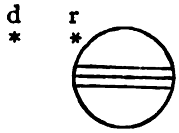
I.



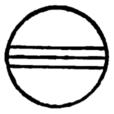
III.



II.



IV. No Eclipse.



Configurations at 15h 0m for an Inverting Telescope.

Day.	West.		East.
1	4· 2·	○	·1 ·3
~~2~~	4· 1·	○	3· ·2●
3	4· 3·	○	·1 2·
~~4~~	·4 3· ·1 2·	○	
5	·4 ·3 ·2	○	1·
6	·4 ·1·3	○	·2
~~7~~	·4	○	1· 2· ·3
8	2·	○	·1 ·4 ·3
9	1· ·2	○	3· ·4
10	3·	○	·1 ·2 ·4
11	3· 1· 2·	○	·4
~~12~~	·3 ·2	○	1· 4·
13	·3 ·1	○	·2 4·
~~14~~		○	1· 2· ·3 4·
15	2·	○	4· ·3 ·1●
~~16~~ ○4·	·2 1·	○	3·
~~17~~ ○3·	4·	○	·1 ·2
~~18~~ ○2·	4· 3· 1·	○	
19	4· ·3 ·2	○	·1
~~20~~	4· ·3 ·1	○	·2
21	·4	○	1· ·3 2·
22	·4 2· ·1	○	·3
23 ○1·	·4 ·2	○	3·
~~24~~	·4	○	3· ·1 ·2
25	3· 1·	○	2· ·4
26	·3 2·	○	·1 ·4
27	·3 ·1	○	·2 ·4
28		○	·3 1· 2· ·4
29	2· ·1	○	·3 4·
30	·2	○	1· 3· 4·
31		○	·1 3· ·2 4·

WASHINGTON MEAN TIME.

APRIL.

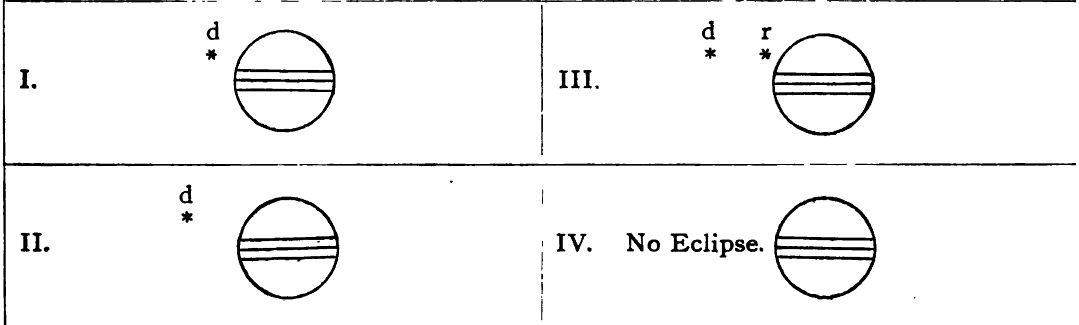
d	h	m	s			
1	8	42		I.	Sh.	In.
	9	47		I.	Tr.	In.
	10	55		I.	Sh.	Eg.
	11	59		I.*	Tr.	Eg.
	17	32		II.	Sh.	In.
	19	42		II.	Tr.	In.
	19	57		II.	Sh.	Eg.
	22	7		II.	Tr.	Eg.
2	6	4	33.3	I.	Ec.	Dis.
	9	19		I.	Oc.	Re.
3	3	10		I.	Sh.	In.
	4	14		I.	Tr.	In.
	5	23		I.	Sh.	Eg.
	6	27		I.	Tr.	Eg.
	11	44	6.2	II.*	Ec.	Dis.
	16	14		II.*	Oc.	Re.
4	0	32	52.0	I.	Ec.	Dis.
	3	46		I.	Oc.	Re.
	6	16	0.0	III.	Ec.	Dis.
	7	53	47.0	III.	Ec.	Re.
	10	30		III.	Oc.	Dis.
	12	9		III.*	Oc.	Re.
	21	39		I.	Sh.	In.
	22	41		I.	Tr.	In.
	23	51		I.	Sh.	Eg.
5	0	54		I.	Tr.	Eg.
	6	49		II.	Sh.	In.
	8	54		II.	Tr.	In.
	9	15		II.	Sh.	Eg.
	11	19		II.	Tr.	Eg.
	19	1	15.7	I.	Ec.	Dis.
	22	13		I.	Oc.	Re.
6	16	7		I.*	Sh.	In.
	17	8		I.	Tr.	In.
	18	20		I.	Sh.	Eg.
	19	20		I.	Tr.	Eg.
7	1	0	55.8	II.	Ec.	Dis.
	5	26		II.	Oc.	Re.
	13	29	35.8	I.*	Ec.	Dis.
	16	40		I.*	Oc.	Re.
	19	54		III.	Sh.	In.
	21	46		III.	Sh.	Eg.
8	0	4		III.	Tr.	In.
	1	42		III.	Tr.	Eg.
	10	35		I.	Sh.	In.
	11	35		I.*	Tr.	In.
	12	48		I.*	Sh.	Eg.
	13	47		I.*	Tr.	Eg.
	20	6		II.	Sh.	In.
	22	6		II.	Tr.	In.
	22	32		II.	Sh.	Eg.
9	0	31		II.	Tr.	Eg.
	7	58	1.4	I.	Ec.	Dis.
	11	7		I.	Oc.	Re.
10	5	3		I.	Sh.	In.
	6	2		I.	Tr.	In.
	7	16		I.	Sh.	Eg.
	8	14		I.	Tr.	Eg.
	14	18	3.8	II.*	Ec.	Dis.
	18	37		II.	Oc.	Re.
11	2	26	20.8	I.	Ec.	Dis.
	5	34		I.	Oc.	Re.
11	10	13	15.6	III.	Ec.	Dis.
	11	52	0.4	III.*	Ec.	Re.
	14	5		III.*	Oc.	Dis.
	15	43		III.*	Oc.	Re.
	23	32		I.	Sh.	In.
12	0	29		I.	Tr.	In.
	1	45		I.	Sh.	Eg.
	2	41		I.	Tr.	Eg.
	9	23		II.	Sh.	In.
	11	17		II.*	Tr.	In.
	11	49		II.*	Sh.	Eg.
	13	41		II.*	Tr.	Eg.
	20	54	45.1	I.	Ec.	Dis.
13	0	1		I.	Oc.	Re.
	18	0		I.	Sh.	In.
	18	56		I.	Tr.	In.
	20	13		I.	Sh.	Eg.
	21	8		I.	Tr.	Eg.
14	3	34	58.4	II.	Ec.	Dis.
	7	48		II.	Oc.	Re.
	15	23	6.0	I.*	Ec.	Dis.
	18	28		I.	Oc.	Re.
	23	51		III.	Sh.	In.
15	1	45		III.	Sh.	Eg.
	3	36		III.	Tr.	In.
	5	14		III.	Tr.	Eg.
	12	29		I.*	Sh.	In.
	13	22		I.*	Tr.	In.
	14	41		I.*	Sh.	Eg.
	15	34		I.*	Tr.	Eg.
	22	41		II.	Sh.	In.
16	0	28		II.	Tr.	In.
	1	7		II.	Sh.	Eg.
	2	52		II.	Tr.	Eg.
	9	51	32.3	I.	Ec.	Dis.
	12	54		I.*	Oc.	Re.
17	6	57		I.	Sh.	In.
	7	49		I.	Tr.	In.
	9	10		I.	Sh.	Eg.
	10	1		I.	Tr.	Eg.
	16	52	15.1	II.*	Ec.	Dis.
	20	58		II.	Oc.	Re.
18	4	19	52.7	I.	Ec.	Dis.
	7	21		I.	Oc.	Re.
	14	10	27.5	III.*	Ec.	Dis.
	15	50	12.0	III.*	Ec.	Re.
	17	35		III.	Oc.	Dis.
	19	12		III.	Oc.	Re.
19	1	25		I.	Sh.	In.
	2	16		I.	Tr.	In.
	3	38		I.	Sh.	Eg.
	4	28		I.	Tr.	Eg.
	11	58		II.*	Sh.	In.
	13	37		II.*	Tr.	In.
	14	24		II.*	Sh.	Eg.
	16	2		II.*	Tr.	Eg.
	22	48	17.6	I.	Ec.	Dis.
20	1	47		I.	Oc.	Re.
	19	54		I.	Sh.	In.
	20	42		I.	Tr.	In.
	22	7		I.	Sh.	Eg.
	22	54		I.	Tr.	Eg.
21	6	9	15.0	II.	Ec.	Dis.
	10	8		II.	Oc.	Re.
	17	16	39.4	I.	Ec.	Dis.
	20	14		I.	Oc.	Re.
22	3	49		III.	Sh.	In.
	5	43		III.	Sh.	Eg.
	7	5		III.	Tr.	In.
	8	42		III.	Tr.	Eg.
	14	22		I.*	Sh.	In.
	15	9		I.*	Tr.	In.
	16	35		I.*	Sh.	Eg.
	17	21		I.	Tr.	Eg.
23	1	15		II.	Sh.	In.
	2	47		II.	Tr.	In.
	3	41		II.	Sh.	Eg.
	5	12		II.	Tr.	Eg.
	11	45	6.4	I.*	Ec.	Dis.
	14	40		I.*	Oc.	Re.
24	8	51		I.	Sh.	In.
	9	35		I.	Tr.	In.
	11	3		I.*	Sh.	Eg.
	11	47		I.*	Tr.	Eg.
	19	26	40.8	II.	Ec.	Dis.
	23	17		II.	Oc.	Re.
25	6	13	28.0	I.	Ec.	Dis.
	9	7		I.	Oc.	Re.
	18	7	45.0	III.	Ec.	Dis.
	19	48	30.2	III.	Ec.	Re.
	21	1		III.	Oc.	Dis.
	22	38		III.	Oc.	Re.
26	3	19		I.	Sh.	In.
	4	2		I.	Tr.	In.
	5	32		I.	Sh.	Eg.
	6	14		I.	Tr.	Eg.
	14	32		II.*	Sh.	In.
	15	57		II.*	Tr.	In.
	16	58		II.	Sh.	Eg.
	18	21		II.	Tr.	Eg.
27	0	41	52.6	I.	Ec.	Dis.
	3	33		I.	Oc.	Re.
	21	48		I.	Sh.	In.
	22	28		I.	Tr.	In.
28	0	0		I.	Sh.	Eg.
	0	40		I.	Tr.	Eg.
	8	43	46.2	II.	Ec.	Dis.
	12	26		II.*	Oc.	Re.
	19	10	16.5	I.	Ec.	Dis.
	21	59		I.	Oc.	Re.
29	7	46		III.	Sh.	In.
	9	42		III.	Sh.	Eg.
	10	29		III.*	Tr.	In.
	12	6		III.*	Tr.	Eg.
	16	16		I.*	Sh.	In.
	16	54		I.	Tr.	In.
	18	29		I.	Sh.	Eg.
	19	6		I.	Tr.	Eg.
30	3	49		II.	Sh.	In.
	5	5		II.	Tr.	In.
	6	15		II.	Sh.	Eg.
	7	29		II.	Tr.	Eg.
	13	38	44.6	I.*	Ec.	Dis.
	16	25		I.*	Oc.	Re.

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 14h 0m for an Inverting Telescope.

Day.	West.		East.
1	3· 1·	○	2· 4·
2	3· 2· 4·	○	·1
3	4· ·3 1·	○	·2 ●
4	4·	○	·3 1· 2·
5	4· ·1 2·	○	·3
6	·4 ·2	○	1· 3·
7	·4 ·1	○	3··2
8	·4 3· 1·	○	2·
9	3· ·4 2·	○	·1
10	·3 1· ·2 ·4	○	
11		○	·1 ·4 ·2 ·3 ●
12	·1 2·	○	·3 ·4
13	·2	○	1· 3· ·4
14	·1	○	·2 3· ·4
15	○ 1· 3·	○	2· 4·
16	3· 2·	○	·1 4·
17	·3 1··2	○	4·
18	·3	○	4· ·1 ·2
19	○ 2· 1· 4·	○	·3
20	4· ·2	○	1· 3·
21	4· ·1	○	·2 3·
22	4· 3·	○	1· 2·
23	·4 3· 2·	○	·1 ●
24	·4 ·3 ·2 1·	○	
25	·4 ·3	○	·1 ·2
26	·4 1·	○	2· ·3
27	·2	○	·4 1· ·3
28	·1	○	·2 3· ·4
29	3·	○	1· 2· ·4
30	3· 2· ·1	○	·4

WASHINGTON MEAN TIME.

MAY.

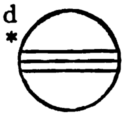
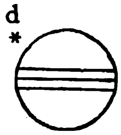
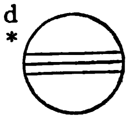
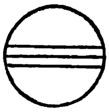
d	h	m	s			
1	10	44		I.*	Sh.	In.
	11	20		I.*	Tr.	In.
	12	57		I.*	Sh.	Eg.
	13	32		I.*	Tr.	Eg.
	22	1	22.0	II.	Ec.	Dis.
2	1	35		II.	Oc.	Re.
	8	7	7.2	I.	Ec.	Dis.
	10	52		I.*	Oc.	Re.
	22	5	15.2	III.	Ec.	Dis.
	23	47	2.4	III.	Ec.	Re.
3	0	23		III.	Oc.	Dis.
	2	1		III.	Oc.	Re.
	5	13		I.	Sh.	In.
	5	47		I.	Tr.	In.
	7	26		I.	Sh.	Eg.
	7	59		I.	Tr.	Eg.
	17	6		II.	Sh.	In.
	18	13		II.	Tr.	In.
	19	32		II.	Sh.	Eg.
	20	37		II.	Tr.	Eg.
4	2	35	34.0	I.	Ec.	Dis.
	5	18		I.	Oc.	Re.
	23	41		I.	Sh.	In.
5	0	13		I.	Tr.	In.
	1	54		I.	Sh.	Eg.
	2	25		I.	Tr.	Eg.
	11	18	33.3	II.*	Ec.	Dis.
	14	43		II.*	Oc.	Re.
	21	3	57.8	I.	Ec.	Dis.
	23	44		I.	Oc.	Re.
6	11	44		III.*	Sh.	In.
	13	40		III.*	Sh.	Eg.
	13	49		III.*	Tr.	In.
	15	27		III.*	Tr.	Eg.
	18	10		I.	Sh.	In.
	18	39		I.	Tr.	In.
	20	22		I.	Sh.	Eg.
	20	51		I.	Tr.	Eg.
7	6	24		II.	Sh.	In.
	7	21		II.	Tr.	In.
	8	50		II.	Sh.	Eg.
	9	45		II.*	Tr.	Eg.
	15	32	27.1	I.*	Ec.	Dis.
	18	10		I.	Oc.	Re.
8	12	38		I.*	Sh.	In.
	13	5		I.*	Tr.	In.
	14	51		I.*	Sh.	Eg.
	15	17		I.*	Tr.	Eg.
9	0	36	19.5	II.	Ec.	Dis.
	3	52		II.	Oc.	Re.
	10	0	51.2	I.*	Ec.	Dis.
	12	36		I.*	Oc.	Re.
10	2	3	27.8	III.	Ec.	Dis.
	5	22		III.	Oc.	Re.
	7	7		I.	Sh.	In.
	7	31		I.	Tr.	In.
	9	20		I.*	Sh.	Eg.
	9	43		I.*	Tr.	Eg.
	19	41		II.	Sh.	In.
	20	29		II.	Tr.	In.
	22	7		II.	Sh.	Eg.
	22	53		II.	Tr.	Eg.
11	4	29	19.0	I.	Ec.	Dis.
	7	2		I.	Oc.	Re.
12	1	35		I.	Sh.	In.
	1	57		I.	Tr.	In.
	3	48		I.	Sh.	Eg.
	4	9		I.	Tr.	Eg.
	13	53	36.6	II.*	Ec.	Dis.
	16	59		II.	Oc.	Re.
	22	57	44.3	I.	Ec.	Dis.
13	1	28		I.	Oc.	Re.
	15	41		III.*	Sh.	In.
	17	8		III.	Tr.	In.
	17	39		III.	Sh.	Eg.
	18	47		III.	Tr.	Eg.
	20	4		I.	Sh.	In.
	20	23		I.	Tr.	In.
	22	17		I.	Sh.	Eg.
	22	35		I.	Tr.	Eg.
14	8	58		II.	Sh.	In.
	9	37		II.*	Tr.	In.
	11	25		II.*	Sh.	Eg.
	12	1		II.*	Tr.	Eg.
	17	26	14.7	I.	Ec.	Dis.
	19	54		I.	Oc.	Re.
15	14	32		I.*	Sh.	In.
	14	49		I.*	Tr.	In.
	16	45		I.	Sh.	Eg.
	17	1		I.	Tr.	Eg.
16	3	11	33.0	II.	Ec.	Dis.
	6	7		II.	Oc.	Re.
	11	54	40.4	I.*	Ec.	Dis.
	14	20		I.*	Oc.	Re.
17	6	1	22.5	III.	Ec.	Dis.
	8	40		III.	Oc.	Re.
	9	1		I.*	Sh.	In.
	9	15		I.*	Tr.	In.
	11	14		I.*	Sh.	Eg.
	11	27		I.*	Tr.	Eg.
	22	15		II.	Sh.	In.
	22	43		II.	Tr.	In.
18	0	42		II.	Sh.	Eg.
	1	7		II.	Tr.	Eg.
	6	23	9.3	I.	Ec.	Dis.
	8	46		I.*	Oc.	Re.
19	3	29		I.	Sh.	In.
	3	41		I.	Tr.	In.
	5	42		I.	Sh.	Eg.
	5	53		I.	Tr.	Eg.
	16	28	56.3	II.	Ec.	Dis.
	19	15		II.	Oc.	Re.
20	0	51	36.1	I.	Ec.	Dis.
	3	12		I.	Oc.	Re.
	19	39		III.	Sh.	In.
	20	25		III.	Tr.	In.
	21	38		III.	Sh.	Eg.
	21	58		I.	Sh.	In.
	22	5		III.	Tr.	Eg.
	22	7		I.	Tr.	In.
21	0	11		I.	Sh.	Eg.
	0	19		I.	Tr.	Eg.
	11	32		II.*	Sh.	In.
21	11	50		II.*	Tr.	In.
	13	59		II.*	Sh.	Eg.
	14	14		II.*	Tr.	Eg.
	19	20	7.8	I.	Ec.	Dis.
	21	38		I.	Oc.	Re.
22	16	26		I.	Sh.	In.
	16	33		I.	Tr.	In.
	18	39		I.	Sh.	Eg.
	18	45		I.	Tr.	Eg.
23	5	47	3.0	II.	Ec.	Dis.
	8	22		II.	Oc.	Re.
	13	48	35.0	I.*	Ec.	Dis.
	16	4		I.*	Oc.	Re.
24	9	59	43.4	III.*	Ec.	Dis.
	10	55		I.*	Sh.	In.
	10	59		I.*	Tr.	In.
	11	58		III.*	Oc.	Re.
	13	8		I.*	Sh.	Eg.
	13	11		I.*	Tr.	Eg.
25	0	49		II.	Sh.	In.
	0	57		II.	Tr.	In.
	3	17		II.	Sh.	Eg.
	3	21		II.	Tr.	Eg.
	8	17	5.0	I.*	Ec.	Dis.
	10	31		I.*	Oc.	Re.
26	5	23		I.	Sh.	In.
	5	25		I.	Tr.	In.
	7	36		I.	Sh.	Eg.
	7	37		I.	Tr.	Eg.
	19	4	32.1	II.	Ec.	Dis.
	21	30		II.	Oc.	Re.
27	2	44		I.	Oc.	Dis.
	4	56		I.	Oc.	Re.
	23	38		III.	Sh.	In.
	23	42		III.	Tr.	In.
	23	51		I.	Tr.	In.
	23	52		I.	Sh.	In.
28	1	23		III.	Tr.	Eg.
	1	38		III.	Sh.	Eg.
	2	3		I.	Tr.	Eg.
	2	5		I.	Sh.	Eg.
	14	4		II.*	Tr.	In.
	14	6		II.*	Sh.	In.
	16	28		II.	Tr.	Eg.
	16	34		II.	Sh.	Eg.
	21	10		I.	Oc.	Dis.
	23	22	19.0	I.	Ec.	Re.
29	18	17		I.	Tr.	In.
	18	20		I.	Sh.	In.
	20	29		I.	Tr.	Eg.
	20	34		I.	Sh.	Eg.
30	8	13		II.*	Oc.	Dis.
	10	47	9.2	II.*	Ec.	Re.
	15	35		I.*	Oc.	Dis.
	17	50	48.2	I.	Ec.	Re.
31	12	43		I.*	Tr.	In.
	12	49		I.*	Sh.	In.
	13	33		III.*	Oc.	Dis.
	14	55		I *	Tr.	Eg.
	15	2		I.*	Sh.	Eg.
	15	43	44.3	III.*	Ec.	Re.

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. 	III. 
II. 	IV. No Eclipse. 

Configurations at 12^h 30^m for an Inverting Telescope.

Day.	West.		East.
1	○ 1· ·3 ·2	○	4·
2	·3	○	·1 ·2 4·
3	1·	○	2· ·3 4·
4	2·	○	·1 4· ·3
5	·1	○ 4·	3· ·2 ●
6	4·	○ 3·	1· 2·
7	4· 3· ·1 2·	○	
8	4· ·3 ·2	○	1·
9	4· ·3	○	·2 ·1 ●
10	·4 1·	○	·3 2·
11	·4 2·	○	·1 ·3
12	·4 1· ·2	○	3·
13	·4	○	3· 1· ·2
14	3· ·1 2·	○	·4
15	3· ·2	○	1· ·4
16	·3	○	·2 ·4 ·1 ●
17	1·	○	·3 2· ·4
18	2·	○	·1 ·3 4·
19	1· ·2	○	3· 4·
20		○	3· ·1 ·2 4·
21	○ 2· 3· ·1	○	4·
22	3· ·2 4·	○	1·
23	4· ·3 ·1	○	·2
24	○ 1· 4·	○	2· ·3 ●
25	4· 2·	○	·1 ·3
26	·4 ·2 1·	○	3·
27	·4	○	·1 3· ·2
28	·4 3· ·1	○	2·
29	3· ·4 ·2	○	1·
30	·3 ·1	○	·2 ·4 ●
31		·3 ○ 1·	2· ·4

WASHINGTON MEAN TIME.

JUNE.

d	h	m	s			
1	3	10		II.	Tr.	In.
	3	23		II.	Sh.	In.
	5	35		II.	Tr.	Eg.
	5	51		II.	Sh.	Eg.
	10	1		I.*	Oc.	Dis.
	12	19	19.7	I.*	Ec.	Re.
2	7	9		I.	Tr.	In.
	7	18		I.	Sh.	In.
	9	21		I.*	Tr.	Eg.
	9	31		I.*	Sh.	Eg.
	21	20		II.	Oc.	Dis.
3	0	4	57.2	II.	Ec.	Re.
	4	27		I.	Oc.	Dis.
	6	47	49.6	I.	Ec.	Re.
4	1	35		I.	Tr.	In.
	1	46		I.	Sh.	In.
	2	58		III.	Tr.	In.
	3	37		III.	Sh.	In.
	3	47		I.	Tr.	Eg.
	3	59		I.	Sh.	Eg.
	4	41		III.	Tr.	Eg.
	5	38		III.	Sh.	Eg.
	16	17		II.	Tr.	In.
	16	40		II.	Sh.	In.
	18	42		II.	Tr.	Eg.
	19	9		II.	Sh.	Eg.
	22	53		I.	Oc.	Dis.
5	1	16	24.2	I.	Ec.	Re.
	20	1		I.	Tr.	In.
	20	15		I.	Sh.	In.
	22	13		I.	Tr.	Eg.
	22	28		I.	Sh.	Eg.
6	10	28		II.*	Oc.	Dis.
	13	23	36.3	II.*	Ec.	Re.
	17	19		I.	Oc.	Dis.
	19	44	55.1	I.	Ec.	Re.
7	14	27		I.*	Tr.	In.
	14	43		I.*	Sh.	In.
	16	39		I.	Tr.	Eg.
	16	49		III.	Oc.	Dis.
	16	57		I.	Sh.	Eg.
	19	42	43.1	III.	Ec.	Re.
8	5	24		II.	Tr.	In.
	5	57		II.	Sh.	In.
	7	49		II.	Tr.	Eg.
	8	26		II.*	Sh.	Eg.
	11	45		I.*	Oc.	Dis.
	14	13	28.2	I.*	Ec.	Re.
9	8	53		I.*	Tr.	In.
	9	12		I.*	Sh.	In.
	11	6		I.*	Tr.	Eg.
	11	25		I.*	Sh.	Eg.
	23	36		II.	Oc.	Dis.
10	2	41	30.0	II.	Ec.	Re.
	6	11		I.	Oc.	Dis.
	8	41	59.7	I.*	Ec.	Re.
11	3	19		I.	Tr.	In.
	3	41		I.	Sh.	In.
	5	32		I.	Tr.	Eg.
	5	54		I.	Sh.	Eg.
	6	16		III.	Tr.	In.
	7	36		III.	Sh.	In.

d	h	m	s			
11	8	1		III.	Tr.	Eg.
	9	37		III.*	Sh.	Eg.
	18	31		II.	Tr.	In.
	19	15		II.	Sh.	In.
	20	56		II.	Tr.	Eg.
	21	43		II.	Sh.	Eg.
12	0	37		I.	Oc.	Dis.
	3	10	35.5	I.	Ec.	Re.
	21	46		I.	Tr.	In.
	22	9		I.	Sh.	In.
	23	58		I.	Tr.	Eg.
13	0	23		I.	Sh.	Eg.
	12	44		II.*	Oc.	Dis.
	16	0	19.0	II.	Ec.	Re.
	19	3		I.	Oc.	Dis.
	21	39	8.2	I.	Ec.	Re.
14	16	12		I.	Tr.	In.
	16	38		I.	Sh.	In.
	18	24		I.	Tr.	Eg.
	18	51		I.	Sh.	Eg.
	20	6		III.	Oc.	Dis.
	21	53		III.	Oc.	Re.
	21	53	28.7	III.	Ec.	Dis.
	23	41	52.5	III.	Ec.	Re.
15	7	38		II.	Tr.	In.
	8	32		II.*	Sh.	In.
	10	3		II.*	Tr.	Eg.
	11	0		II.*	Sh.	Eg.
	13	30		I.	Oc.	Dis.
	16	7	42.5	I.	Ec.	Re.
16	10	38		I.*	Tr.	In.
	11	7		I.*	Sh.	In.
	12	51		I.	Tr.	Eg.
	13	20		I.*	Sh.	Eg.
17	1	52		II.	Oc.	Dis.
	5	18	18.2	II.	Ec.	Re.
	7	56		I.	Oc.	Dis.
	10	36	15.6	I.	Ec.	Re.
18	5	5		I.	Tr.	In.
	5	36		I.	Sh.	In.
	7	17		I.	Tr.	Eg.
	7	49		I.	Sh.	Eg.
	9	33		III.*	Tr.	In.
	11	22		III.*	Tr.	Eg.
	11	34		III.*	Sh.	In.
	13	37		III.*	Sh.	Eg.
	20	45		II.	Tr.	In.
	21	49		II.	Sh.	In.
	23	11		II.	Tr.	Eg.
19	0	18		II.	Sh.	Eg.
	2	22		I.	Oc.	Dis.
	5	4	52.5	I.	Ec.	Re.
	23	31		I.	Tr.	In.
20	0	4		I.	Sh.	In.
	1	43		I.	Tr.	Eg.
	2	17		I.	Sh.	Eg.
	15	2		II.	Oc.	Dis.
	18	37	15.7	II.	Ec.	Re.
	20	48		I.	Oc.	Dis.
	23	33	26.8	I.	Ec.	Re.
21	17	57		I.	Tr.	In.

d	h	m	s			
21	18	33		I.	Sh.	In.
	20	10		I.	Tr.	Eg.
	20	46		I.	Sh.	Eg.
	23	25		III.	Oc.	Dis.
22	1	15		III.	Oc.	Re.
	1	51	43.6	III.	Ec.	Dis.
	3	41	16.6	III.	Ec.	Re.
	9	53		II.*	Tr.	In.
	11	6		II.*	Sh.	In.
	12	19		II.*	Tr.	Eg.
	13	35		II.*	Sh.	Eg.
	15	15		I.	Oc.	Dis.
	18	2	2.4	I.	Ec.	Re.
23	12	24		I.	Tr.	In.
	13	2		I.*	Sh.	In.
	14	36		I.	Tr.	Eg.
	15	15		I.	Sh.	Eg.
24	4	10		II.	Oc.	Dis.
	7	55	20.2	II.	Ec.	Re.
	9	41		I.*	Oc.	Dis.
	12	30	36.7	I.*	Ec.	Re.
25	6	50		I.	Tr.	In.
	7	30		I.	Sh.	In.
	9	3		I.*	Tr.	Eg.
	9	44		I.*	Sh.	Eg.
	12	55		III.*	Tr.	In.
	14	46		III.	Tr.	Eg.
	15	32		III.	Sh.	In.
	17	36		III.	Sh.	Eg.
	23	1		II.	Tr.	In.
26	0	23		II.	Sh.	In.
	1	27		II.	Tr.	Eg.
	2	52		II.	Sh.	Eg.
	4	7		I.	Oc.	Dis.
	6	59	14.9	I.	Ec.	Re.
27	1	17		I.	Tr.	In.
	1	59		I.	Sh.	In.
	3	29		I.	Tr.	Eg.
	4	12		I.	Sh.	Eg.
	17	20		II.	Oc.	Dis.
	21	14	25.5	II.	Ec.	Re.
	22	34		I.	Oc.	Dis.
28	1	27	50.5	I.	Ec.	Re.
	19	44		I.	Tr.	In.
	20	28		I.	Sh.	In.
	21	56		I.	Tr.	Eg.
	22	41		I.	Sh.	Eg.
29	2	48		III.	Oc.	Dis.
	4	41		III.	Oc.	Re.
	5	50	42.3	III.	Ec.	Dis.
	7	41	24.7	III.	Ec.	Re.
	12	10		II.*	Tr.	In.
	13	40		II.*	Sh.	In.
	14	36		II.	Tr.	Eg.
	16	10		II.	Sh.	Eg.
	17	1		I.	Oc.	Dis.
	19	56	27.2	I.	Ec.	Re.
30	14	10		I.	Tr.	In.
	14	57		I.	Sh.	In.
	16	23		I.	Tr.	Eg.
	17	10		I.	Sh.	Eg.

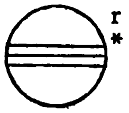
NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

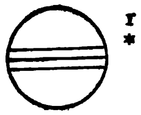
JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

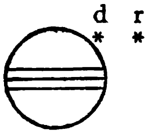
I.



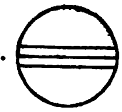
II.



III.



IV. No Eclipse.



Configurations at 11ʰ 30ᵐ for an Inverting Telescope.

Day.	West.		East.
1	2·	○	·3 ·4 ·1●
2	·2 1·	○	3· ·4
3		○	·1 ·2 3· ·4
4	1· 3·	○	2· 4·
5	3· 2·	○	1· 4·
6	·3 ·1	○	4· ·2●
7	·3	○	1· 4· 2·
8	4· 2· ·1	○	·3
9	4· ·2 1·	○	·3
10	4·	○	·1 ·2 3·
11	4· 1· 3·	○	2·
12	·4 3· 2·	○	·1
13	·4 ·3 ·1 ·2	○	
14	·4 ·3	○	1· 2·
15	·4 ·1 2·	○	·3
16	○1· ·2	○	·4 ·3
17		○	·1 ·2 3· ·4
18	○3· 1·	○	2· ·4
19	3· 2·	○	·1 ·4
20	·3 ·1 ·2	○	4·
21	·3	○	1· ·2 4·
22	○2· ·1	○	·3 4·
23	·2	○	1· 4· ·3
24	○4·	○	·2 3· ·1●
25	4· 1·	○	3· 2·
26	4· 3· 2·	○	·1
27	4· ·3 1· ·2	○	
28	4· ·3	○	1· ·2
29	·4 ·1	○	2· ·3
30	·4 ·2	○	1· ·3

WASHINGTON MEAN TIME.

JULY.

d	h	m	s			
1	6	30		II.	Oc.	Dis.
	10	32	35.0	II.*	Ec.	Re.
	11	27		I.*	Oc.	Dis.
	14	25	3.1	I.	Ec.	Re.
2	8	37		I.*	Tr.	In.
	9	25		I.*	Sh.	In.
	10	50		I.*	Tr.	Eg.
	11	39		I.*	Sh.	Eg.
	16	19		III.	Tr.	In.
	18	13		III.	Tr.	Eg.
	19	31		III.	Sh.	In.
	21	36		III.	Sh.	Eg.
3	1	19		II.	Tr.	In.
	2	57		II.	Sh.	In.
	3	45		II.	Tr.	Eg.
	5	27		II.	Sh.	Eg.
	5	54		I.	Oc.	Dis.
	8	53	42.5	I.*	Ec.	Re.
4	3	4		I.	Tr.	In.
	3	54		I.	Sh.	In.
	5	17		I.	Tr.	Eg.
	6	7		I.	Sh.	Eg.
	19	41		II.	Oc.	Dis.
	23	51	47.7	II.	Ec.	Re.
5	0	21		I.	Oc.	Dis.
	3	22	19.5	I.	Ec.	Re.
	21	31		I.	Tr.	In.
	22	23		I.	Sh.	In.
	23	44		I.	Tr.	Eg.
6	0	36		I.	Sh.	Eg.
	6	15		III.	Oc.	Dis.
	8	10		III.*	Oc.	Re.
	9	49	21.4	III.*	Ec.	Dis.
	11	41	14.2	III.*	Ec.	Re.
	14	29		II.	Tr.	In.
	16	15		II.	Sh.	In.
	16	55		II.	Tr.	Eg.
	18	44		II.	Sh.	Eg.
	18	47		I.	Oc.	Dis.
	21	50	57.4	I.	Ec.	Re.
7	15	58		I.	Tr.	In.
	16	52		I.	Sh.	In.
	18	11		I.	Tr.	Eg.
	19	5		I.	Sh.	Eg.
8	8	52		II.*	Oc.	Dis.
	13	10	1.6	II.*	Ec.	Re.
	13	14		I.*	Oc.	Dis.
	16	19	34.6	I.	Ec.	Re.
9	10	25		I.*	Tr.	In.
	11	20		I.*	Sh.	In.
	12	38		I.*	Tr.	Eg.
	13	34		I.	Sh.	Eg.
	19	48		III.	Tr.	In.
	21	45		III.	Tr.	Eg.
	23	30		III.	Sh.	In.
10	1	36		III.	Sh.	Eg.
	3	38		II.	Tr.	In.
	5	32		II.	Sh.	In.
	6	5		II.	Tr.	Eg.
	7	41		I.	Oc.	Dis.
	8	2		II.*	Sh.	Eg.
	10	48	14.8	I.*	Ec.	Re.
11	4	52		I.	Tr.	In.
	5	49		I.	Sh.	In.
	7	5		I.	Tr.	Eg.
11	8	3		I.*	Sh.	Eg.
	22	4		II.	Oc.	Dis.
12	2	8		I.	Oc.	Dis.
	2	29	20.2	II.	Ec.	Re.
	5	16	53.5	I.	Ec.	Re.
	23	19		I.	Tr.	In.
13	0	18		I.	Sh.	In.
	1	32		I.	Tr.	Eg.
	2	31		I.	Sh.	Eg.
	9	46		III.*	Oc.	Dis.
	11	43		III.*	Oc.	Re.
	13	48	23.5	III.	Ec.	Dis.
	15	41	27.5	III.	Ec.	Re.
	16	49		II.	Tr.	In.
	18	49		II.	Sh.	In.
	19	16		II.	Tr.	Eg.
	20	35		I.	Oc.	Dis.
	21	19		II.	Sh.	Eg.
	23	45	31.7	I.	Ec.	Re.
14	17	47		I.	Tr.	In.
	18	47		I.	Sh.	In.
	20	0		I.	Tr.	Eg.
	21	0		I.	Sh.	Eg.
15	11	16		II.*	Oc.	Dis.
	15	2		I.	Oc.	Dis.
	15	47	38.1	II.	Ec.	Re.
	18	14	10.0	I.	Ec.	Re.
16	12	14		I.*	Tr.	In.
	13	16		I.	Sh.	In.
	14	27		I.	Tr.	Eg.
	15	29		I.	Sh.	Eg.
	23	22		III.	Tr.	In.
17	1	21		III.	Tr.	Eg.
	3	30		III.	Sh.	In.
	5	37		III.	Sh.	Eg.
	5	59		II.	Tr.	In.
	8	6		II.*	Sh.	In.
	8	27		II.*	Tr.	Eg.
	9	29		I.*	Oc.	Dis.
	10	36		II.*	Sh.	Eg.
	12	42	50.8	I.	Ec.	Re.
18	6	41		I.	Tr.	In.
	7	44		I.	Sh.	In.
	8	54		I.*	Tr.	Eg.
	9	58		I.*	Sh.	Eg.
19	0	29		II.	Oc.	Dis.
	3	57		I.	Oc.	Dis.
	5	7	2.4	II.	Ec.	Re.
	7	11	30.7	I.	Ec.	Re.
20	1	9		I.	Tr.	In.
	2	13		I.	Sh.	In.
	3	22		I.	Tr.	Eg.
	4	27		I.	Sh.	Eg.
	13	20		III.	Oc.	Dis.
	15	21		III.	Oc.	Re.
	17	46	54 8	III.	Ec.	Dis.
	19	12		II.	Tr.	In.
	19	41	10.8	III.	Ec.	Re.
	21	23		II.	Sh.	In.
	21	40		II.	Tr.	Eg.
	22	24		I	Oc.	Dis.
	23	54		II.	Sh.	Eg.
21	1	40	10.3	I.	Ec.	Re.
	19	36		I.	Tr.	In.
	20	42		I.	Sh.	In.
21	21	49		I.	Tr.	Eg.
	22	56		I.	Sh.	Eg.
22	13	42		II.	Oc.	Dis.
	16	51		I.	Oc.	Dis.
	18	25	23.3	II.	Ec.	Re.
	20	8	49.5	I.	Ec.	Re.
23	14	4		I.	Tr.	In.
	15	11		I.	Sh.	In.
	16	17		I.	Tr.	Eg.
	17	24		I.	Sh.	Eg.
24	2	59		III.	Tr.	In.
	5	1		III.	Tr.	Eg.
	7	30		III.	Sh.	In.
	8	24		II.*	Tr.	In.
	9	37		III.*	Sh.	Eg.
	10	41		II.*	Sh.	In.
	10	52		II.*	Tr.	Eg.
	11	19		I.*	Oc.	Dis.
	13	11		II.	Sh.	Eg.
	14	37	30.8	I.	Ec.	Re.
25	8	31		I.*	Tr.	In.
	9	40		I.*	Sh.	In.
	10	45		I.*	Tr.	Eg.
	11	53		I.*	Sh.	Eg.
26	2	56		II.	Oc.	Dis.
	5	47		I.	Oc.	Dis.
	7	44	51.5	II.	Ec.	Re.
	9	6	11.6	I.*	Ec.	Re.
27	2	59		I.	Tr.	In.
	4	8		I.	Sh.	In.
	5	12		I.	Tr.	Eg.
	6	22		I.	Sh.	Eg.
	16	59		III.	Oc.	Dis.
	19	2		III.	Oc.	Re.
	21	36		II.	Tr.	In.
	21	45	22.4	III.	Ec.	Dis.
	23	40	51.0	III.	Ec.	Re.
	23	58		II.	Sh.	In.
28	0	5		II.	Tr.	Eg.
	0	14		I.	Oc.	Dis.
	2	28		II.	Sh.	Eg.
	3	34	51.8	I.	Ec.	Re.
	21	27		I.	Tr.	In.
	22	37		I.	Sh.	In.
	23	40		I.	Tr.	Eg.
29	0	51		I.	Sh.	Eg.
	16	10		II.	Oc.	Dis.
	18	42		I.	Oc.	Dis.
	21	3	14.5	II.	Ec.	Re.
	22	3	31.7	I.	Ec.	Re.
30	15	55		I.	Tr.	In.
	17	6		I.	Sh.	In.
	18	8		I.	Tr.	Eg.
	19	20		I.	Sh.	Eg.
31	6	41		III.	Tr.	In.
	8	46		III.*	Tr.	Eg.
	10	50		II.*	Tr.	In.
	11	29		III.*	Sh.	In.
	13	10		I.	Oc.	Dis.
	13	15		II.	Sh.	In.
	13	18		II.	Tr.	Eg.
	13	38		III.	Sh.	Eg.
	15	46		II.	Sh.	Eg.
	16	32	13.6	I.	Ec.	Re.

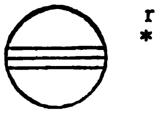
Note.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

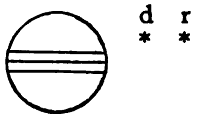
JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

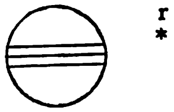
I.



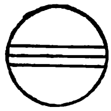
III.



II.



IV. No Eclipse.



Configurations at 10ʰ 0ᵐ for an Inverting Telescope.

Day.	West.		East.
1	·4 ·1	○	·2 3·
2	○1· ·4	○	3· 2·
3	3· 2·	○	·1 ·4
4	3· ·2 1·	○	·4
5	·3	○	·1 ·2 ·4
6	·1	○	·3 2· ·4
7	2·	○	1· ·3 4·
8	·1	○	3· 4· ·2●
9		○	1· 3· 2· 4·
10	3· 2·	○	·1 4·
11	3· ·2 1· 4·	○	
12	4· ·3	○	·1 ·2
13	4· 1·	○	2· ·3●
14	4· 2·	○	1· ·3
15	·4 ·1 ·2	○	3·
16	·4	○	1· 3· 2·
17	·4 3· 2·	○	·1●
18	3· ·4 ·2 1·	○	
19	·3	○	·1 ·2 ·4●
20	1· ·3	○	2· ·4
21	2·	○	·1 ·3 ·4
22	·1 ·2	○	3· ·4
23		○	1· ·2 3· ·4
24	○2· 3· ·1	○	4·
25	○1· 3· ·2	○	4·
26	·3	○	·1 ·2 4·
27	·3 1·	○	4· 2·
28	2· 4·	○	·1 ·3
29	4· ·1 ·2	○	·3
30	4·	○	1· ·2 3·
31	4· ·1 3·	○2·	

WASHINGTON MEAN TIME.

AUGUST.

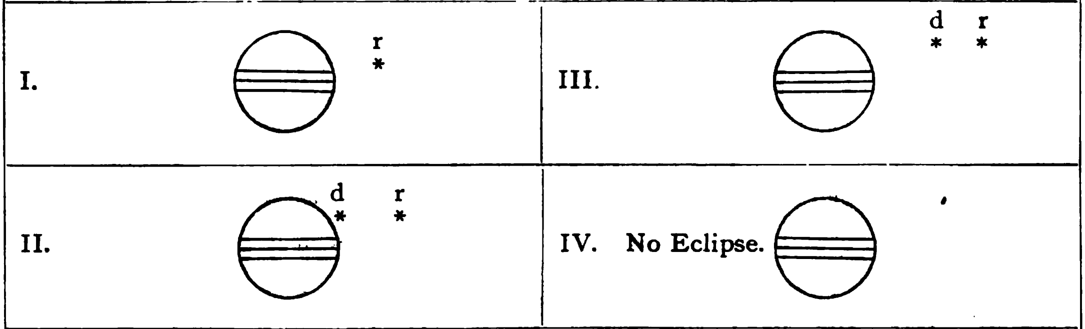
d	h	m	s			
1	10	23		I.*	Tr.	In.
	11	35		I.*	Sh.	In.
	12	36		I.	Tr.	Eg.
	13	49		I.	Sh.	Eg.
2	5	26		II.	Oc.	Dis.
	7	37		I.	Oc.	Dis.
	7	54		II.*	Oc.	Re.
	7	54	50.8	II.*	Ec.	Dis.
	10	22	46.9	II.*	Ec.	Re.
	11	0	55.4	I.*	Ec.	Re.
3	4	51		I.	Tr.	In.
	6	4		I.	Sh.	In.
	7	4		I.	Tr.	Eg.
	8	17		I.*	Sh.	Eg.
	20	42		III.	Oc.	Dis.
	22	48		III.	Oc.	Re.
4	0	4		II.	Tr.	In.
	1	43	57.8	III.	Ec.	Dis.
	2	5		I.	Oc.	Dis.
	2	33		II.	Sh.	In.
	2	34		II.	Tr.	Eg.
	3	40	40.0	III.	Ec.	Re.
	5	3		II.	Sh.	Eg.
	5	29	36.0	I.	Ec.	Re.
	23	19		I.	Tr.	In.
5	0	33		I.	Sh.	In.
	1	32		I.	Tr.	Eg.
	2	46		I.	Sh.	Eg.
	18	41		II.	Oc.	Dis.
	20	33		I.	Oc.	Dis.
	21	10		II.	Oc.	Re.
	21	13	4.8	II.	Ec.	Dis.
	23	41	11.6	II.	Ec.	Re.
	23	58	16.7	I.	Ec.	Re.
6	17	47		I.	Tr.	In.
	19	2		I.	Sh.	In.
	20	1		I.	Tr.	Eg.
	21	15		I.	Sh.	Eg.
7	10	28		III.*	Tr.	In.
	12	35		III.	Tr.	Eg.
	13	18		II.	Tr.	In.
	15	1		I.	Oc.	Dis.
	15	28		III.	Sh.	In.
	15	48		II.	Tr.	Eg.
	15	50		II.	Sh.	In.
	17	38		III.	Sh.	Eg.
	18	22		II.	Sh.	Eg.
	18	26	59.1	I.	Ec.	Re.
8	12	15		I.	Tr.	In.
	13	30		I.	Sh.	In.
	14	29		I.	Tr.	Eg.
	15	44		I.	Sh.	Eg.
9	7	58		II.*	Oc.	Dis.
	9	30		I.*	Oc.	Dis.
	10	27		II.*	Oc.	Re.
	10	32	26.8	II.*	Ec.	Dis.
	12	55	41.5	I.	Ec.	Re.
	13	0	44.8	II.	Ec.	Re.
10	6	44		I.	Tr.	In.
	7	59		I.*	Sh.	In.
	8	57		I.*	Tr.	Eg.
	10	13		I.*	Sh.	Eg.
11	0	31		III.	Oc.	Dis.
	2	33		II.	Tr.	In.
	2	39		III.	Oc.	Re.
	3	58		I.	Oc.	Dis.
	5	4		II.	Tr.	Eg.
	5	7		II.	Sh.	In.
	5	42	43.1	III.	Ec.	Dis.
11	7	24	22.6	I.	Ec.	Re.
	7	38		II.*	Sh.	Eg.
	7	40	39.3	III.*	Ec.	Re.
12	1	12		I.	Tr.	In.
	2	28		I.	Sh.	In.
	3	26		I.	Tr.	Eg.
	4	42		I.	Sh.	Eg.
	21	14		II.	Oc.	Dis.
	22	26		I.	Oc.	Dis.
	23	44		II.	Oc.	Re.
	23	50	42.4	II.	Ec.	Dis.
13	1	53	4.0	I.	Ec.	Re.
	2	19	11.6	II.	Ec.	Re.
	19	41		I.	Tr.	In.
	20	57		I.	Sh.	In.
	21	54		I.	Tr.	Eg.
	23	10		I.	Sh.	Eg.
14	14	18		III.	Tr.	In.
	15	48		II.	Tr.	In.
	16	27		III.	Tr.	Eg.
	16	54		I.	Oc.	Dis.
	18	18		II.	Tr.	Eg.
	18	24		II.	Sh.	In.
	19	27		III.	Sh.	In.
	20	21	46.5	I.	Ec.	Re.
	20	56		II.	Sh.	Eg.
	21	38		III.	Sh.	Eg.
15	14	9		I.	Tr.	In.
	15	26		I.	Sh.	In.
	16	23		I.	Tr.	Eg.
	17	39		I.	Sh.	Eg.
16	10	32		II.*	Oc.	Dis.
	11	23		I.	Oc.	Dis.
	13	2		II.	Oc.	Re.
	13	10	5.4	II.	Ec.	Dis.
	14	50	29.5	I.	Ec.	Re.
	15	38	45.8	II.	Ec.	Re.
17	8	38		I.*	Tr.	In.
	9	55		I.*	Sh.	In.
	10	51		I.	Tr.	Eg.
	12	8		I.	Sh.	Eg.
18	4	24		III.	Oc.	Dis.
	5	5		II.	Tr.	In.
	5	51		I.	Oc.	Dis.
	6	34		III.	Oc.	Re.
	7	36		II.*	Tr.	Eg.
	7	41		II.*	Sh.	In.
	9	19	11.0	I.*	Ec.	Re.
	9	42	8.0	III.*	Ec.	Dis.
	10	14		II.*	Sh.	Eg.
	11	41	18.5	III.	Ec.	Re.
19	3	6		I.	Tr.	In.
	4	23		I.	Sh.	In.
	5	20		I.	Tr.	Eg.
	6	37		I.	Sh.	Eg.
	23	49		II.	Oc.	Dis.
20	0	20		I.	Oc.	Dis.
	2	20		II.	Oc.	Re.
	2	28	21.5	II.	Ec.	Dis.
	3	47	52.7	I.	Ec.	Re.
	4	57	13.1	II.	Ec.	Re.
	21	35		I.	Tr.	In.
	22	52		I.	Sh.	In.
	23	48		I.	Tr.	Eg.
21	1	6		I.	Sh.	Eg.
	18	13		III.	Tr.	In.
	18	21		II.	Tr.	In.
	18	48		I.	Oc.	Dis.
	20	25		III.	Tr.	Eg.
21	20	53		II.	Tr.	Eg.
	20	59		II.	Sh.	In.
	22	16	35.5	I.	Ec.	Re.
	23	26		III.	Sh.	In.
	23	31		II.	Sh.	Eg.
22	1	38		III.	Sh.	Eg.
	16	4		I.	Tr.	In.
	17	21		I.	Sh.	In.
	18	17		I.	Tr.	Eg.
	19	35		I.	Sh.	Eg.
23	13	8		II.	Oc.	Dis.
	13	17		I.	Oc.	Dis.
	15	39		II.	Oc.	Re.
	15	47	44.7	II.	Ec.	Dis.
	16	45	19.2	I.	Ec.	Re.
	18	16	47.3	II.	Ec.	Re.
24	10	32		I.	Tr.	In.
	11	50		I.	Sh.	In.
	12	46		I.	Tr.	Eg.
	14	4		I.	Sh.	Eg.
25	7	38		II.*	Tr.	In.
	7	45		I.*	Oc.	Dis.
	8	21		III.*	Oc.	Dis.
	10	10		II.	Tr.	Eg.
	10	16		II.	Sh.	In.
	10	33		III.	Oc.	Re.
	11	14	0.6	I.	Ec.	Re.
	12	49		II.	Sh.	Eg.
	13	41	8.0	III.	Ec.	Dis.
	15	41	33.2	III.	Ec.	Re.
26	5	1		I.	Tr.	In.
	6	19		I.	Sh.	In.
	7	15		I.*	Tr.	Eg.
	8	33		I.*	Sh.	Eg.
27	2	14		I.	Oc.	Dis.
	2	27		II.	Oc.	Dis.
	4	58		II.	Oc.	Re.
	5	6	1.4	II.	Ec.	Dis.
	5	42	42.7	I.	Ec.	Re.
	7	35	14.6	II.*	Ec.	Re.
	23	30		I.	Tr.	In.
28	0	48		I.	Sh.	In.
	1	44		I.	Tr.	Eg.
	3	1		I.	Sh.	Eg.
	20	43		I.	Oc.	Dis.
	20	56		II.	Tr.	In.
	22	13		III.	Tr.	In.
	23	27		II.	Tr.	Eg.
	23	34		II.	Sh.	In.
29	0	11	25.6	I.	Ec.	Re.
	0	26		III.	Tr.	Eg.
	2	7		II.	Sh.	Eg.
	3	26		III.	Sh.	In.
	5	39		III.	Sh.	Eg.
	17	59		I.	Tr.	In.
	19	16		I.	Sh.	In.
	20	13		I.	Tr.	Eg.
	21	30		I.	Sh.	Eg.
30	15	12		I.	Oc.	Dis.
	15	47		II.	Oc.	Dis.
	18	18		II.	Oc.	Re.
	18	25	24.0	II.	Ec.	Dis.
	18	40	9.2	I.	Ec.	Re.
	20	54	47.8	II.	Ec.	Re.
31	12	28		I.	Tr.	In.
	13	45		I.	Sh.	In.
	14	42		I.	Tr.	Eg.
	15	59		I.	Sh.	Eg.

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 9h 0m for an Inverting Telescope.

Day.	West.		East.
1	·4 3· 2·	○	1·
2	·4 ·3	○	·2 ·1●
3	·4 ·3 1·	○	2·
4	·4 2·	○	·1 ·3
5	·2 1·	○	·4 ·3
6		○	1· ·2 ·4 3·
7	·1	○	3· 2· ·4
8	3· 2·	○	1· ·4
9	·3 ·1	○	4· ·2●
10	○1· ·3	○	2· 4·
11	2·	○	·1 ·3 4·
12	·2 1·	○	4· ·3
13	○4·	○	·1 ·2 3·
14	4· ·1	○	3· 2·
15	4· 2· 3·	○	1·
16	4· 3· ·1·2	○	
17	○1· 4· ·3	○	• ·2
18	·4 2·	○	·3 ·1
19	·4 2· 1·	○	·3●
20	·4	○	·2 ·1 3·
21	1· ·4	○	3· 2·
22	2· 3·	○	·4 1·
23	3· ·1 ·2	○	·4
24	·3	○	1· ·2 ·4
25	○2·	○	·4 ·3● ·1●
26	·2 1·	○	·3 4·
27		○	·2 ·1 3· 4·
28	1·	○	3· 2· 4·
29	2· 3·	○	1· 4·
30	3· ·2 ·1 4·	○	
31	·3 4·	○	1· ·2

WASHINGTON MEAN TIME.

SEPTEMBER.

d	h	m	s			
1	9	41		I.*	Oc.	Dis.
	10	14		II.	Tr.	In.
	12	23		III.	Oc.	Dis.
	12	46		II.	Tr.	Eg.
	12	51		II.	Sh.	In.
	13	8	50.8	I.	Ec.	Re.
	14	37		III.	Oc.	Re.
	15	24		II.	Sh.	Eg.
	17	40	25.3	III.	Ec.	Dis.
	19	42	5.5	III.	Ec.	Re.
2	6	57		I.*	Tr.	In.
	8	14		I.*	Sh.	In.
	9	11		I.*	Tr.	Eg.
	10	28		I.	Sh.	Eg.
3	4	10		I.	Oc.	Dis.
	5	6		II.	Oc.	Dis.
	7	37	33.0	I.*	Ec.	Re.
	7	38		II.*	Oc.	Re.
	7	43	40.3	II.*	Ec.	Dis.
	10	13	14.3	II.	Ec.	Re.
4	1	26		I.	Tr.	In.
	2	43		I.	Sh.	In.
	3	40		I.	Tr.	Eg.
	4	57		I.	Sh.	Eg.
	22	39		I.	Oc.	Dis.
	23	33		II.	Tr.	In.
5	2	5		II.	Tr.	Eg.
	2	6	15.3	I.	Ec.	Re.
	2	8		II.	Sh.	In.
	2	17		III.	Tr.	In.
	4	32		III.	Tr.	Eg.
	4	41		II.	Sh.	Eg.
	7	26		III.*	Sh.	In.
	9	40		III.	Sh.	Eg.
	19	56		I.	Tr.	In.
	21	12		I.	Sh.	In.
	22	10		I.	Tr.	Eg.
	23	26		I.	Sh.	Eg.
6	17	8		I.	Oc.	Dis.
	18	27		II.	Oc.	Dis.
	20	34	59.3	I.	Ec.	Re.
	20	58		II.	Oc.	Re.
	21	3	0.6	II.	Ec.	Dis.
	23	32	44.8	II.	Ec.	Re.
7	14	25		I.	Tr.	In.
	15	41		I.	Sh.	In.
	16	39		I.	Tr.	Eg.
	17	55		I.	Sh.	Eg.
8	11	37		I.	Oc.	Dis.
	12	53		II.	Tr.	In.
	15	3	41.0	I.	Ec.	Re.
	15	24		II.	Tr.	Eg.
	15	26		II.	Sh.	In.
	16	27		III.	Oc.	Dis.
	17	59		II.	Sh.	Eg.
	18	43		III.	Oc.	Re.
	21	39	8.6	III.	Ec.	Dis.
	23	42	4.2	III.	Ec.	Re.
9	8	54		I.*	Tr.	In.
	10	9		I.	Sh.	In.
	11	8		I.	Tr.	Eg.
	12	23		I.	Sh.	Eg.
10	6	6		I.	Oc.	Dis.
	7	47		II.*	Oc.	Dis.
	9	32	23.2	I.	Ec.	Re.
	10	19		II.	Oc.	Re.
10	10	21	16.0	II.	Ec.	Dis.
	12	51	10.4	II.	Ec.	Re.
11	3	24		I.	Tr.	In.
	4	38		I.	Sh.	In.
	5	38		I.	Tr.	Eg.
	6	52		I.	Sh.	Eg.
12	0	35		I.	Oc.	Dis.
	2	12		II.	Tr.	In.
	4	1	5.6	I.	Ec.	Re.
	4	43		II.	Sh.	In.
	4	44		II.	Tr.	Eg.
	6	24		III.	Tr.	In.
	7	16		II.*	Sh.	Eg.
	8	41		III.*	Tr.	Eg.
	11	25		III.	Sh.	In.
	13	41		III.	Sh.	Eg.
	21	53		I.	Tr.	In.
	23	7		I.	Sh.	In.
13	0	7		I.	Tr.	Eg.
	1	21		I.	Sh.	Eg.
	19	5		I.	Oc.	Dis.
	21	9		II.	Oc.	Dis.
	22	29	49.7	I.	Ec.	Re.
14	2	10	38.0	II.	Ec.	Re.
	16	23		I.	Tr.	In.
	17	36		I.	Sh.	In.
	18	37		I.	Tr.	Eg.
	19	50		I.	Sh.	Eg.
15	13	34		I.	Oc.	Dis.
	15	32		II.	Tr.	In.
	16	58	31.0	I.	Ec.	Re.
	18	1		II.	Sh.	In.
	18	4		II.	Tr.	Eg.
	20	34		II.	Sh.	Eg.
	20	35		III.	Oc.	Dis.
	22	53		III.	Oc.	Re.
16	1	37	44.6	III.	Ec.	Dis.
	3	41	56.0	III.	Ec.	Re.
	10	52		I.	Tr.	In.
	12	5		I.	Sh.	In.
	13	6		I.	Tr.	Eg.
	14	19		I.	Sh.	Eg.
17	8	3		I.*	Oc.	Dis.
	10	30		II.	Oc.	Dis.
	11	27	13.4	I.	Ec.	Re.
	15	29	2.1	II.	Ec.	Re.
18	5	22		I.	Tr.	In.
	6	34		I.	Sh.	In.
	7	36		I.*	Tr.	Eg.
	8	48		I.*	Sh.	Eg.
19	2	33		I.	Oc.	Dis.
	4	53		II.	Tr.	In.
	5	55	55.3	I.	Ec.	Re.
	7	18		II.*	Sh.	In.
	7	25		II.*	Tr.	Eg.
	9	51		II.	Sh.	Eg.
	10	34		III.	Tr.	In.
	12	53		III.	Tr.	Eg.
	15	25		III.	Sh.	In.
	17	42		III.	Sh.	Eg.
	23	51		I.	Tr.	In.
20	1	3		I.	Sh.	In.
	2	5		I.	Tr.	Eg.
	3	17		I.	Sh.	Eg.
	21	2		I.	Oc.	Dis.
20	23	52		II.	Oc.	Dis.
21	0	24	39.6	I.	Ec.	Re.
	4	48	25.6	II.	Ec.	Re.
	18	21		I.	Tr.	In.
	19	31		I.	Sh.	In.
	20	35		I.	Tr.	Eg.
	21	45		I.	Sh.	Eg.
22	15	32		I.	Oc.	Dis.
	18	13		II.	Tr.	In.
	18	53	20.5	I.	Ec.	Re.
	20	36		II.	Sh.	In.
	20	46		II.	Tr.	Eg.
	23	9		II.	Sh.	Eg.
23	0	46		III.	Oc.	Dis.
	3	5		III.	Oc.	Re.
	5	36	27.0	III.	Ec.	Dis.
	7	41	55.0	III.*	Ec.	Re.
	12	50		I.	Tr.	In.
	14	0		I.	Sh.	In.
	15	5		I.	Tr.	Eg.
	16	14		I.	Sh.	Eg.
24	10	1		I.	Oc.	Dis.
	13	14		II.	Oc.	Dis.
	13	22	3.0	I.	Ec.	Re.
	18	6	47.7	II.	Ec.	Re.
25	7	20		I.*	Tr.	In.
	8	29		I.	Sh.	In.
	9	34		I.	Tr.	Eg.
	10	43		I.	Sh.	Eg.
26	4	31		I.	Oc.	Dis.
	7	35		II.*	Tr.	In.
	7	50	44.4	I.*	Ec.	Re.
	9	53		II.	Sh.	In.
	10	7		II.	Tr.	Eg.
	12	27		II.	Sh.	Eg.
	14	47		III.	Tr.	In.
	17	7		III.	Tr.	Eg.
	19	23		III.	Sh.	In.
	21	42		III.	Sh.	Eg.
27	1	50		I.	Tr.	In.
	2	58		I.	Sh.	In.
	4	4		I.	Tr.	Eg.
	5	12		I.	Sh.	Eg.
	23	1		I.	Oc.	Dis.
28	2	19	28.8	I.	Oc.	Re.
	2	37		II.	Oc.	Dis.
	7	26	6.3	II.*	Ec.	Re.
	20	20		I.	Tr.	In.
	21	26		I.	Sh.	In.
	22	34		I.	Tr.	Eg.
	23	41		I.	Sh.	Eg.
29	17	30		I.	Oc.	Dis.
	20	48	9.5	I.	Ec.	Re.
	20	56		II.	Tr.	In.
	23	11		II.	Sh.	In.
	23	30		II.	Tr.	Eg.
30	1	45		II.	Sh.	Eg.
	5	0		III.	Oc.	Dis.
	7	21		III.*	Oc.	Re.
	9	35	15.2	III.	Ec.	Dis.
	11	42	0.0	III.	Ec.	Re.
	14	49		I.	Tr.	In.
	15	55		I.	Sh.	In.
	17	4		I.	Tr.	Eg.
	18	9		I.	Sh.	Eg.

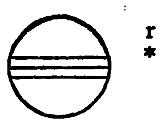
Note.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc ,denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

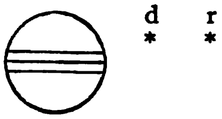
SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

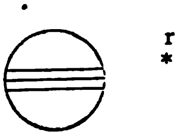
I.



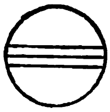
III.



II.



IV. No Eclipse.



Configurations at 8h 0m for an Inverting Telescope.

Day.	West.	East.
1	4• •3 •1	○ 2•
2	○ 1• 4• 2•	○ •3
3	4•	○ •2 •1 •3
4	•4 1•	○ 2• 3•
5	•4 2• 3•	○ •1
6	3• •4 •2 •1	○
7	•3 •4	○ 1• •2
8	•3 •1	○ 2• •4
9	2•	○ 1• •3 •4
10		○ •3 •4 •2 ● •1 ●
11	1•	○ 2• 3• •4
12	○ 3• 2•	○ •1 4•
13	3• •2 1•	○ 4•
14	•3	○ 1• •2 4•
15	•3 •1	○ 2• 4•
16	2• 4•	○ 1• •3
17	4• •2 •1	○ •3
18	4• 1•	○ •2 3•
19	4• 2•	○ 3• •1
20	•4 3• •2 1•	○
21	•4 •3	○ •2 •1
22	•4 •3 •1	○ 2•
23	•4 2•	○ •3 1•
24	•2 •1	○ •3 •4 ●
25	○ 1•	○ •4 •2 3•
26	○ 2•	○ •1 3• •4
27	•2 3• 1•	○ •4
28	3•	○ •2 •1 •4
29	•3 •1	○ 2• 4•
30	2•	○ 1• 4• •3 ●

WASHINGTON MEAN TIME.

OCTOBER.

d	h	m	s				d	h	m	s				d	h	m	s			
1	12	0		I.	Oc.	Dis.	11	6	48		I.*	Sh.	In.	21	20	50		I.	Tr.	In.
	15	16	51.7	I.	Ec.	Re.		8	4		I.	Tr.	Eg.		21	32	43.3	III.	Ec.	Dis.
	16	0		II.	Oc.	Dis.		9	2		I.	Sh.	Eg.		21	40		I.	Sh.	In.
	20	44	25.7	II.	Ec.	Re.	12	2	59		I.	Oc.	Dis.		23	4		I.	Tr.	Eg.
2	9	19		I.	Tr.	In.		6	9	3.3	I.	Ec.	Re.		23	43	18.7	III.	Ec.	Re.
	10	24		I.	Sh.	In.		8	10		II.	Oc.	Dis.		23	55		I.	Sh.	Eg.
	11	34		I.	Tr.	Eg.		12	40	59.5	II.	Ec.	Re.	22	17	59		I.	Oc.	Dis.
	12	38		I.	Sh.	Eg.	13	0	19		I.	Tr.	In.		21	1	8.7	I.	Ec.	Re.
3	6	30		I.*	Oc.	Dis.		1	17		I.	Sh.	In.	23	0	22		II.	Oc.	Dis.
	9	45	32.5	I.	Ec.	Re.		2	34		I.	Tr.	Eg.		4	36	19.6	II.	Ec.	Re.
	10	18		II.	Tr.	In.		3	31		I.	Sh.	Eg.		15	20		I.	Tr.	In.
	12	28		II.	Sh.	In.		21	29		I.	Oc.	Dis.		16	9		I.	Sh.	In.
	12	52		II.	Tr.	Eg.	14	0	37	43.0	I.	Ec.	Re.		17	34		I.	Tr.	Eg.
	15	3		II.	Sh.	Eg.		2	26		II.	Tr.	In.		18	24		I.	Sh.	Eg.
	19	2		III.	Tr.	In.		4	21		II.	Sh.	In.	24	12	29		I	Oc.	Dis.
	21	24		III.	Tr.	Eg.		5	0		II.	Tr.	Eg.		15	29	47.5	I.	Ec.	Re.
	23	22		III.	Sh.	In.		6	56		II.	Sh.	Eg.		18	36		II.	Tr.	In.
4	1	42		III.	Sh.	Eg.		13	38		III.	Oc.	Dis.		20	14		II.	Sh.	In.
	3	49		I.	Tr.	In.		16	1		III.	Oc.	Re.		21	11		II.	Tr.	Eg.
	4	53		I.	Sh.	In.		17	33	35.2	III.	Ec.	Dis.		22	49		II.	Sh.	Eg.
	6	4		I.*	Tr.	Eg.		18	49		I.	Tr.	In.	25	8	5		III.	Tr.	In.
	7	7		I.*	Sh.	Eg.		19	42	53.4	III.	Ec.	Re.		9	50		I.	Tr.	In.
5	0	59		I.	Oc.	Dis.		19	45		I.	Sh.	In.		10	30		III.	Tr.	Eg.
	4	14	16.8	I.	Ec.	Re.		21	4		I.	Tr.	Eg.		10	38		I.	Sh.	In.
	5	23		II.	Oc.	Dis.		22	0		I.	Sh.	Eg.		11	20		III.	Sh.	In.
	10	3	37.8	II.	Ec.	Re.	15	15	59		I.	Oc.	Dis.		12	5		I.	Tr.	Eg.
	22	19		I.	Tr.	In.		19	6	24.7	I.	Ec.	Re.		12	52		I.	Sh.	Eg.
	23	22		I.	Sh.	In.		21	34		II.	Oc.	Dis.		13	42		III.	Sh.	Eg.
6	0	34		I.	Tr.	Eg.	16	1	59	12.2	II.	Ec.	Re.	26	6	59		I.	Oc.	Dis.
	1	36		I.	Sh.	Eg.		13	19		I.	Tr.	In.		9	58	30.8	I.	Ec.	Re.
	19	29		I.	Oc.	Dis.		14	14		I.	Sh.	In.		13	47		II.	Oc.	Dis.
	22	42	57.2	I.	Ec.	Re.		15	34		I.	Tr.	Eg.		17	55	10.3	II.	Ec.	Re.
	23	41		II.	Tr.	In.		16	29		I.	Sh.	Eg.	27	4	20		I.	Tr.	In.
7	1	46		II.	Sh.	In.	17	10	29		I.	Oc.	Dis.		5	7		I.	Sh.	In.
	2	14		II.	Tr.	Eg.		13	35	4.3	I.	Ec.	Re.		6	35		I.	Tr.	Eg.
	4	20		II.	Sh.	Eg.		15	49		II.	Tr.	In.		7	21		I.	Sh.	Eg.
	9	18		III.	Oc.	Dis.		17	38		II.	Sh.	In.	28	1	29		I.	Oc.	Dis.
	11	40		III.	Oc.	Re.		18	23		II.	Tr.	Eg.		4	27	9.6	I.	Ec.	Re.
	13	34	40.1	III.	Ec.	Dis.		20	13		II.	Sh.	Eg.		8	0		II.	Tr.	In.
	15	42	41.3	III.	Ec.	Re.	18	3	42		III.	Tr.	In.		9	31		II.	Sh.	In.
	16	49		I.	Tr.	In.		6	5		III.	Tr.	Eg.		10	35		II.	Tr.	Eg.
	17	50		I.	Sh.	In.		7	20		III.	Sh.	In.		12	7		II.	Sh.	Eg.
	19	3		I.	Tr.	Eg.		7	49		I.	Tr.	In.		22	22		III.	Oc.	Dis.
	20	5		I.	Sh.	Eg.		8	43		I.	Sh.	In.		22	50		I.	Tr.	In.
8	13	59		I.	Oc.	Dis.		9	42		III.	Sh.	Eg.		23	35		I.	Sh.	In.
	17	11	39.2	I.	Ec.	Re.		10	4		I.	Tr.	Eg.	29	0	48		III.	Oc.	Re.
	18	46		II.	Oc.	Dis.		10	57		I.	Sh.	Eg.		1	5		I.	Tr.	Eg.
	23	21	54.1	II.	Ec.	Re.	19	4	59		I.	Oc.	Dis.		1	31	16.1	III.	Ec.	Dis.
9	11	19		I.	Tr.	In.		8	3	48.0	I.	Ec.	Re.		1	50		I.	Sh.	Eg.
	12	19		I.	Sh.	In.		10	58		II.	Oc.	Dis.		3	43	9.0	III.	Ec.	Re.
	13	34		I.	Tr.	Eg.		15	18	11.6	II.	Ec.	Re.		19	59		I.	Oc.	Dis.
	14	34		I.	Sh.	Eg.	20	2	19		I.	Tr.	In.		22	55	50.5	I.	Ec.	Re.
10	8	29		I.	Oc.	Dis.		3	12		I.	Sh.	In.	30	3	11		II.	Oc.	Dis.
	11	40	19.5	I.	Ec.	Re.		4	34		I.	Tr.	Eg.		7	13	14.8	II.	Ec.	Re.
	13	3		II.	Tr.	In.		5	26		I.	Sh.	Eg.		17	21		I.	Tr.	In.
	15	3		II.	Sh.	In.		23	29		I.	Oc.	Dis.		18	4		I.	Sh.	In.
	15	37		II.	Tr.	Eg.	21	2	32	27.3	I.	Ec.	Re.		19	35		I.	Tr.	Eg.
	17	38		II.	Sh.	Eg.		5	12		II.	Tr.	In.		20	19		I.	Sh.	Eg.
	23	21		III.	Tr.	In.		6	56		II.*	Sh.	In.	31	14	30		I.	Oc.	Dis.
11	1	44		III.	Tr.	Eg.		7	47		II.	Tr.	Eg.		17	24	28.7	I.	Ec.	Re.
	3	21		III.	Sh.	In.		9	31		II.	Sh.	Eg.		21	24		II.	Tr.	In.
	5	42		III.	Sh.	Eg.		18	0		III.	Oc.	Dis.		22	49		II.	Sh.	In.
	5	49		I.	Tr.	In.		20	24		III.	Oc.	Re.		23	59		II.	Tr.	Eg.

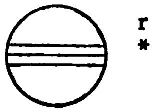
Note.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

WASHINGTON MEAN TIME.

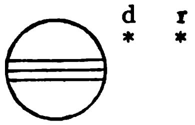
OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

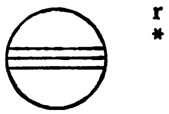
I.



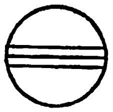
III.



II.



IV. No Eclipse.



Configurations at 6^h 30^m for an Inverting Telescope.

Day.	West.		East.
1	·2 ·1	○	·3 4·
2		○	1· 4· ·2 3·
3	4·	○	2· 3· ·1 ●
4	4· 2· 3· 1·	○	
5	4· 3·	○	·1 ·2 ●
6	4· ·3 1·	○	2·
7	·4 2· ·3	○	·1
8	·4 ·2 ·1	○	·3
9	·4	○	1· ·2 3·
10	·4 ·1	○	2· 3·
11	○ 1· 2· 3·	○	·4 ●
12	3· ·2	○	·1 ·4
13	·3 1·	○	·2 ·4
14	·3 2·	○	·1 ·4
15	·2 ·1	○	·3 ·4
16		○	·2 1· ·3 4·
17	·1	○	2· 3· 4·
18	○ 3· 2·	○	1· 4·
19	3· ·2	○	4· ·1 ●
20	·3 4· 1·	○	·2
21	○ 2· 4· ·3	○	·1
22	4· ·2 1·	○	·3
23	4·	○	·2 1· ·3
24	·4 ·1	○	2· 3·
25	·4 2·	○	3· 1·
26	·4 3· ·2 ·1	○	
27	○ 1· ·3 ·4	○	·2
28	·3	○	·4 2· ·1
29	2· 1·	○	·3 ·4
30		○	·2 ·1 ·3 ·4
31	·1	○	2· 3· ·4

WASHINGTON MEAN TIME.

NOVEMBER.

d	h	m	s			
1	1	25		II.	Sh.	Eg.
	11	51		I.	Tr.	In.
	12	29		III.	Tr.	In.
	12	33		I.	Sh.	In.
	14	5		I.	Tr.	Eg.
	14	47		I.	Sh.	Eg.
	14	55		III.	Tr.	Eg.
	15	19		III.	Sh.	In.
	17	43		III.	Sh.	Eg.
2	9	0		I.	Oc.	Dis.
	11	53	11.5	I.	Ec.	Re.
	16	36		II.	Oc.	Dis.
	20	31	56.7	II.	Ec.	Re.
3	6	21		I.	Tr.	In.
	7	1		I.	Sh.	In.
	8	36		I.	Tr.	Eg.
	9	16		I.	Sh.	Eg.
4	3	30		I.	Oc.	Dis.
	6	21	49.6	I.	Ec.	Re.
	10	48		II.	Tr.	In.
	12	7		II.	Sh.	In.
	13	24		II.	Tr.	Eg.
	14	42		II.	Sh.	Eg.
5	0	51		I.	Tr.	In.
	1	30		I.	Sh.	In.
	2	47		III.	Oc.	Dis.
	3	6		I.	Tr.	Eg.
	3	45		I.	Sh.	Eg.
	5	14		III.	Oc.	Re.
	5	29	38.8	III.	Ec.	Dis.
	7	42	49.2	III.	Ec.	Re.
	22	1		I.	Oc.	Dis.
6	0	50	30.1	I.	Ec.	Re.
6	6	0		II.	Oc.	Dis.
	9	49	57.5	II.	Ec.	Re.
	19	22		I.	Tr.	In.
	19	59		I.	Sh.	In.
	21	36		I.	Tr.	Eg.
	22	13		I.	Sh.	Eg.
7	16	31		I.	Oc.	Dis.
	19	19	7.6	I.	Ec.	Re.
8	0	12		II.	Tr.	In.
	1	24		II.	Sh.	In.
	2	48		II.	Tr.	Eg.
	4	0		II.	Sh.	Eg.
	13	52		I.	Tr.	In.
	14	27		I.	Sh.	In.
	16	7		I.	Tr.	Eg.
	16	42		I.	Sh.	Eg.
	17	15		III.	Tr.	In.
	19	18		III.	Sh.	In.
	19	22		III.	Tr.	Eg.
	21	43		III.	Sh.	Eg.
9	11	1		I.	Oc.	Dis.
	13	47	50.0	I.	Ec.	Re.
	19	25		II.	Oc.	Dis.
	23	8	31.0	II.	Ec.	Re.
10	8	22		I.	Tr.	In.
	8	56		I.	Sh.	In.
	10	37		I.	Tr.	Eg.
	11	11		I.	Sh.	Eg.
11	5	32		I.*	Oc.	Dis.
	8	16	27.2	I.	Ec.	Re.
	13	37		II.	Tr.	In.
	14	42		II.	Sh.	In.
	16	13		II.	Tr.	Eg.
11	17	18		II.	Sh.	Eg.
12	2	53		I.	Tr.	In.
	3	25		I.	Sh.	In.
	5	7		I.	Tr.	Eg.
	5	40		I.*	Sh.	Eg.
	7	12		III.	Oc.	Dis.
	11	42	36.0	III.	Ec.	Re.
13	0	2		I.	Oc.	Dis.
	2	45	7.1	I.	Ec.	Re.
	8	50		II.	Oc.	Dis.
	12	26	27.5	II.	Ec.	Re.
	21	23		I.	Tr.	In.
	21	53		I.	Sh.	In.
	23	38		I.	Tr.	Eg.
14	0	8		I.	Sh.	Eg.
	18	32		I.	Oc.	Dis.
	21	13	43.4	I.	Ec.	Re.
15	3	2		II.	Tr.	In.
	4	0		II.	Sh.	In.
	5	38		II.*	Tr.	Eg.
	6	36		II.	Sh.	Eg.
	15	54		I.	Tr.	In.
	16	22		I.	Sh.	In.
	18	8		I.	Tr.	Eg.
	18	37		I.	Sh.	Eg.
	21	41		III.	Tr.	In.
	23	17		III.	Sh.	In.
	23	50		III.	Tr.	Eg.
16	1	43		III.	Sh.	Eg.
	13	2		I.	Oc.	Dis.
	15	42	25.1	I.	Ec.	Re.
	22	15		II.	Oc.	Dis.

THE SATELLITES OF JUPITER

ARE NOT VISIBLE THIS YEAR AFTER NOVEMBER 16,

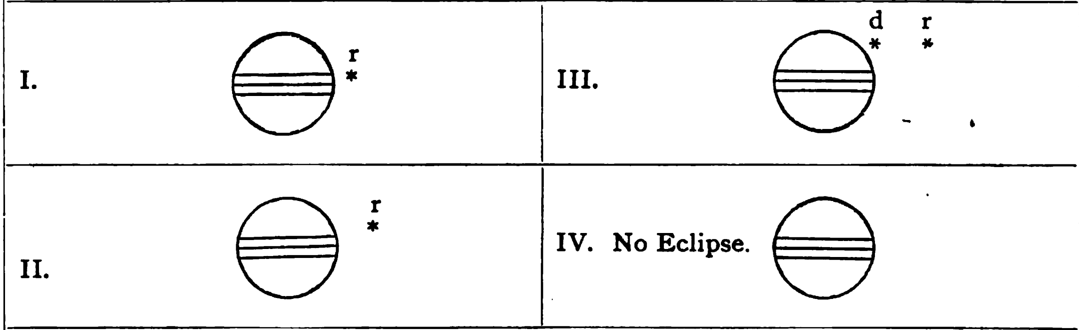
JUPITER BEING TOO NEAR TO THE SUN.

NOTE.—In., denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc., denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

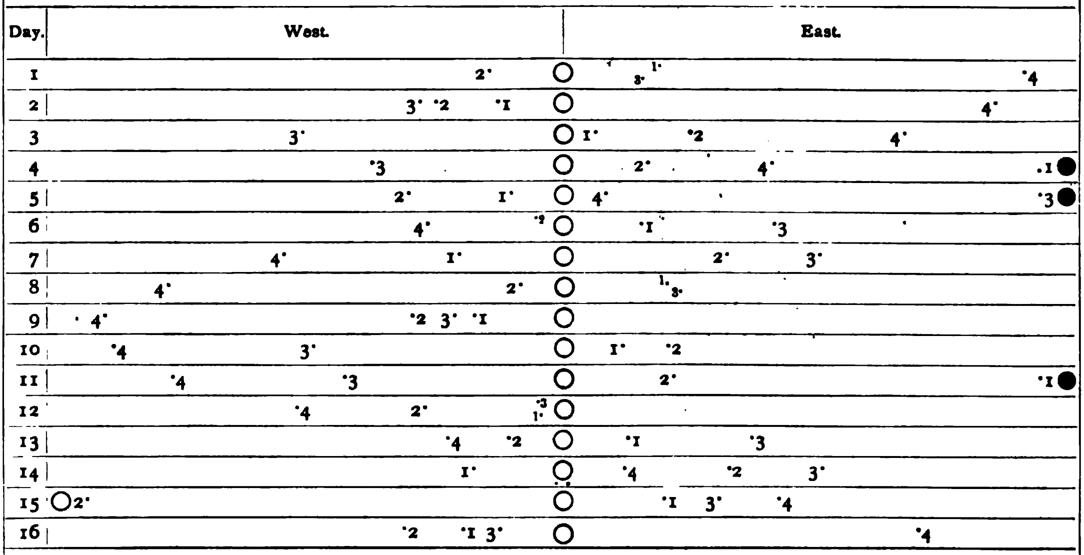
WASHINGTON MEAN TIME.

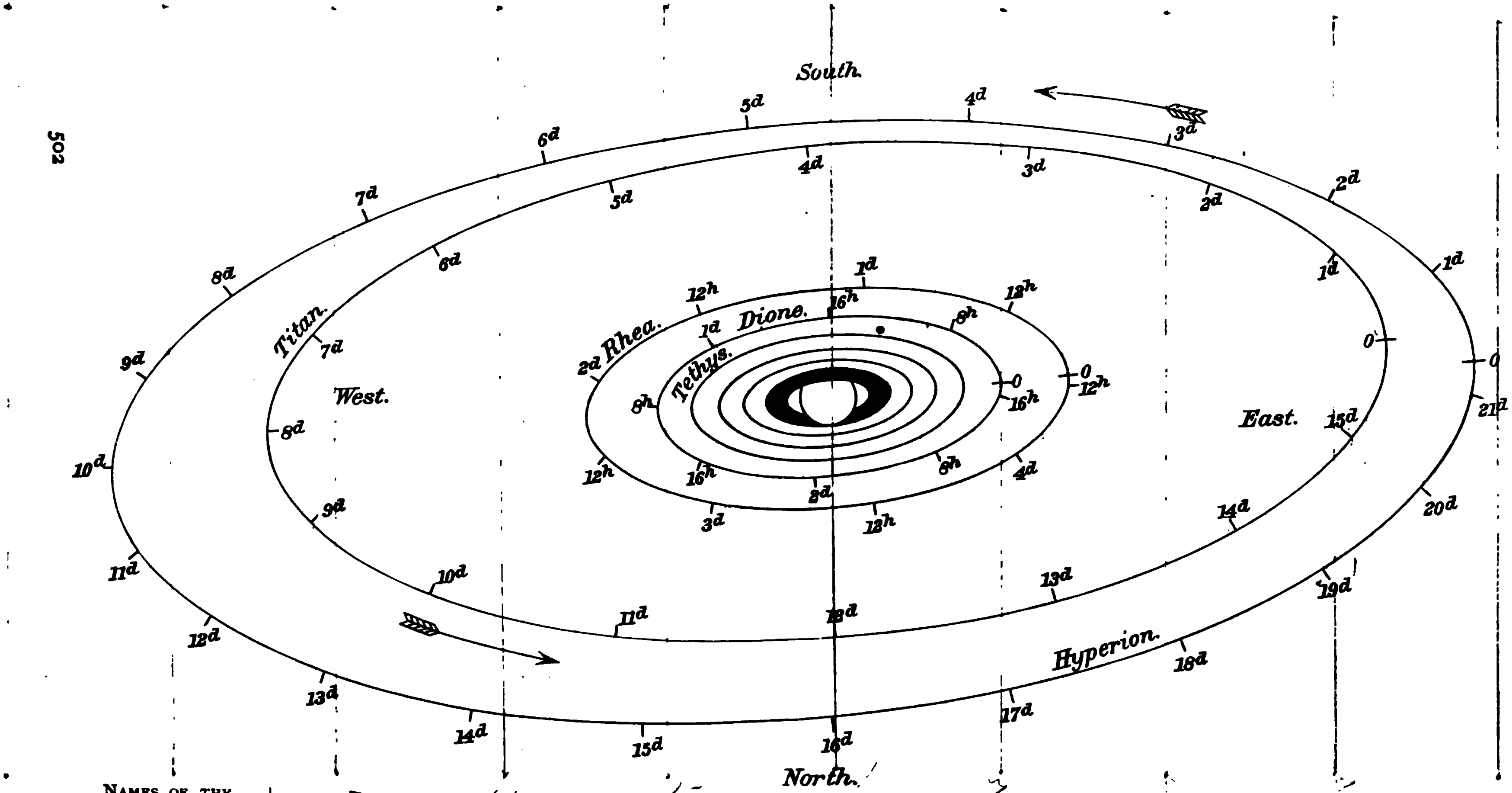
NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at $5^h\ 30^m$ for an Inverting Telescope.





Names of the Satellites.	
I.	Mimas.
II.	Enceladus.
III.	Tethys.
IV.	Dione.
V.	Rhea.
VI.	Titan.
VII.	Hyperion.
VIII.	Iapetus.

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,

AT OPPOSITION IN 1900,

AS SEEN IN AN INVERTING TELESCOPE.

Mean Synodic Periods.	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.6
VIII.	79	22.1

WASHINGTON MEAN TIME OF GREATEST ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "o" are those of the eastern elongation, as seen in an inverting telescope. The apparent positions of a satellite at any time may be marked on the diagram by counting around the orbit the interval in days and hours which has elapsed since the last east elongation. The times of these elongations may be found from the following tables. Mimas can be seen only within a few hours of each elongation: the time of every elongation visible at Washington is therefore given. The times of other elongations of any satellite in the same direction may be found by adding or subtracting any multiple of the period. For the three outer satellites the times of elongation and conjunction are given. The following abbreviations are used:—

E., East Elongation,
I., Inferior Conjunction (south of planet),
W., West Elongation,
S., Superior Conjunction (north of planet).

MIMAS.

Greatest Elongations Visible at Washington.

	d	h	
Mar.	23	16.9	E.
	24	15.5	E.
	25	14.1	E.
	31	17.1	W.
Apr.	1	15.8	W.
	2	14.4	W.
	8	17.4	E.
	9	16.0	E.
	10	14.6	E.
	11	13.2	E.
	17	16.2	W.
	18	14.9	W.
	19	13.5	W.
	20	12.1	W.
	25	16.5	E.
	26	15.1	E.
	27	13.7	E.
	28	12.3	E.
May	3	16.7	W.
May	4	15.3	W.
	5	13.9	W.
	6	12.5	W.
	7	11.2	W.
	12	15.5	E.
	13	14.2	E.
	14	12.8	E.
	15	11.4	E.
	20	15.8	W.
	21	14.4	W.
	22	13.0	W.
	23	11.6	W.
	24	10.2	W.
	28	16.0	E.
	29	14.6	E.
	30	13.2	E.
	31	11.8	E.
June	1	10.4	E.
	2	9.0	E.
June	5	16.2	W.
	6	14.8	W.
	7	13.4	W.
	8	12.0	W.
	9	10.6	W.
	10	9.3	W.
	13	16.4	E.
	14	15.0	E.
	15	13.6	E.
	16	12.2	E.
	17	10.8	E.
	18	9.5	E.
	19	8.1	E.
	22	15.2	W.
	23	13.8	W.
	24	12.5	W.
	25	11.1	W.
	26	9.7	W.
	27	8.3	W.
June	30	15.4	E.
July	1	14.1	E.
	2	12.7	E.
	3	11.3	E.
	4	9.9	E.
	5	8.5	E.
	6	7.2	E.
	9	14.3	W.
	10	12.9	W.
	11	11.5	W.
	12	10.1	W.
	13	8.8	W.
	14	7.4	W.
	17	14.5	E.
	18	13.1	E.
	19	11.7	E.
	20	10.4	E.
	21	9.0	E.
	22	7.6	E.
July	23	6.2	E.
	26	13.4	W.
	27	12.0	W.
	28	10.6	W.
	29	9.2	W.
	30	7.8	W.
Aug.	4	12.2	E.
	5	10.8	E.
	6	9.5	E.
	7	8.1	E.
	12	12.5	W.
	13	11.1	W.
	14	9.7	W.
	15	8.3	W.
	16	7.0	W.
	21	11.4	E.
	22	10.0	E.
	23	8.6	E.
	24	7.2	E.
Aug.	29	11.6	W.
	30	10.2	W.
	31	8.9	W.
Sept.	1	7.5	W.
	7	10.5	E.
	8	9.1	E.
	9	7.8	E.
	16	9.4	W.
	17	8.0	W.
	18	6.7	W.
	24	9.7	E.
	25	8.4	E.
	26	7.0	E.
Oct.	3	8.6	W.
	4	7.3	W.
	5	5.9	W.
	11	9.0	E.
	12	7.6	E.
	13	6.2	E.

ENCELADUS.

	d	h	
Mar.	18	6.0	E.
	19	14.9	E.
	20	23.8	E.
	22	8.7	E.
	23	17.6	E.
	25	2.5	E.
	26	11.4	E.
	27	20.3	E.
	29	5.1	E.
	30	14.0	E.
Mar.	31	22.9	E.
Apr.	2	7.8	E.
	3	16.7	E.
	5	1.6	E.
	6	10.5	E.
	7	19.4	E.
	9	4.2	E.
	10	13.1	E.
	11	22.0	E.
	13	6.9	E.
Apr.	14	15.8	E.
	16	0.6	E.
	17	9.5	E.
	18	18.4	E.
	20	3.3	E.
	21	12.2	E.
	22	21.0	E.
	24	5.9	E.
	25	14.8	E.
	26	23.7	E.
Apr.	28	8.6	E.
	29	17.4	E.
May	1	2.3	E.
	2	11.2	E.
	3	20.1	E.
	5	5.0	E.
	6	13.8	E.
	7	22.7	E.
	9	7.6	E.
	10	16.5	E.
May	12	1.4	E.
	13	10.2	E.
	14	19.1	E.
	16	4.0	E.
	17	12.9	E.
	18	21.7	E.
	20	6.6	E.
	21	15.5	E.
	23	0.4	E.
	24	9.2	E.
May	25	18.1	E.
	27	3.0	E.
	28	11.9	E.
	29	20.8	E.
	31	5.6	E.
June	1	14.5	E.
	2	23.4	E.
	4	8.2	E.
	5	17.1	E.
	7	2.0	E.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

ENCELADUS—(*Concluded.*)

	d	h		d	h		d	h		d	h		d	h		d	h
June	8	10.9 E.	June	29	0.0 E.	July	19	13.1 E.	Aug.	9	2.4 E.	Aug.	29	15.6 E.	Sept.	19	5.0 E.
	9	19.8 E.		30	8.9 E.		20	22.0 E.		10	11.2 E.		31	0.5 E.		20	13.9 E.
	11	4.6 E.	July	1	17.8 E.		22	6.9 E.		11	20.1 E.	Sept.	1	9.4 E.		21	22.8 E.
	12	13.5 E.		3	2.6 E.		23	15.8 E.		13	5.0 E.		2	18.3 E.		23	7.7 E.
	13	22.4 E.		4	11.5 E.		25	0.7 E.		14	13.9 E.		4	3.2 E.		24	16.6 E.
	15	7.2 E.		5	20.4 E.		26	9.6 E.		15	22.8 E.		5	12.1 E.		26	1.5 E.
	16	16.1 E.		7	5.3 E.		27	18.4 E.		17	7.7 E.		6	21.0 E.		27	10.4 E.
	18	1.0 E.		8	14.1 E.		29	3.3 E.		18	16.6 E.		8	5.9 E.		28	19.3 E.
	19	9.9 E.		9	23.0 E.		30	12.2 E.		20	1.4 E.		9	14.8 E.		30	4.2 E.
	20	18.8 E.		11	7.9 E.		31	21.1 E.		21	10.3 E.		10	23.6 E.	Oct.	1	13.0 E.
	22	3.6 E.		12	16.8 E.	Aug.	2	6.0 E.		22	19.2 E.		12	8.5 E.		2	21.9 E.
	23	12.5 E.		14	1.6 E.		3	14.8 E.		24	4.1 E.		13	17.4 E.		4	6.8 E.
	24	21.4 E.		15	10.5 E.		4	23.7 E.		25	13.0 E.		15	2.3 E.		5	15.7 E.
	26	6.2 E.		16	19.4 E.		6	8.6 E.		26	21.9 E.		16	11.2 E.		7	0.6 E.
	27	15.1 E.		18	4.3 E.		7	17.5 E.		28	6.8 E.		17	20.1 E.		8	9.5 E.

TETHYS.

	d	h		d	h		d	h		d	h		d	h		d	h
Mar.	5	1.2 E.	Apr.	9	22.1 E.	May	15	18.8 E.	June	20	15.3 E.	July	26	11.8 E.	Aug.	31	8.6 E.
	6	22.5 E.		11	19.4 E.		17	16.1 E.		22	12.6 E.		28	9.1 E.	Sept.	2	5.9 E.
	8	19.8 E.		13	16.8 E.		19	13.4 E.		24	9.9 E.		30	6.4 E.		4	3.2 E.
	10	17.2 E.		15	14.1 E.		21	10.7 E.		26	7.2 E.	Aug.	1	3.7 E.		6	0.5 E.
	12	14.5 E.		17	11.4 E.		23	8.0 E.		28	4.5 E.		3	1.0 E.		7	21.8 E.
	14	11.8 E.		19	8.7 E.		25	5.3 E.		30	1.8 E.		4	22.3 E.		9	19.2 E.
	16	9.1 E.		21	6.0 E.		27	2.6 E.	July	1	23.0 E.		6	19.6 E.		11	16.5 E.
	18	6.4 E.		23	3.3 E.		28	23.8 E.		3	20.3 E.		8	16.9 E.		13	13.8 E.
	20	3.7 E.		25	0.6 E.		30	21.1 E.		5	17.6 E.		10	14.2 E.		15	11.1 E.
	22	1.0 E.		26	21.9 E.	June	1	18.4 E.		7	14.9 E.		12	11.5 E.		17	8.4 E.
	23	22.4 E.		28	19.2 E.		3	15.7 E.		9	12.2 E.		14	8.8 E.		19	5.8 E.
	25	19.7 E.		30	16.4 E.		5	13.0 E.		11	9.5 E.		16	6.1 E.		21	3.1 E.
	27	17.0 E.	May	2	13.8 E.		7	10.3 E.		13	6.8 E.		18	3.4 E.		23	0.4 E.
	29	14.3 E.		4	11.0 E.		9	7.6 E.		15	4.1 E.		20	0.8 E.		24	21.7 E.
	31	11.6 E.		6	8.3 E.		11	4.9 E.		17	1.4 E.		21	22.1 E.		26	19.0 E.
Apr.	2	8.9 E.		8	5.6 E.		13	2.2 E.		18	22.6 E.		23	19.4 E.		28	16.4 E.
	4	6.2 E.		10	2.9 E.		14	23.4 E.		20	20.0 E.		25	16.7 E.		30	13.7 E.
	6	3.5 E.		12	0.2 E.		16	20.7 E.		22	17.2 E.		27	14.0 E.	Oct.	2	11.0 E.
	8	0.8 E.		13	21.5 E.		18	18.0 E.		24	14.5 E.		29	11.3 E.		4	8.3 E.

DIONE.

	d	h		d	h		d	h		d	h		d	h		d	h
Mar.	24	6.6 E.	Apr.	26	2.8 E.	May	28	22.7 E.	June	30	18.4 E.	Aug.	2	14.3 E.	Sept.	4	10.5 E.
	27	0.3 E.		28	20.4 E.		31	16.3 E.	July	3	12.1 E.		5	8.0 E.		7	4.2 E.
	29	18.0 E.	May	1	14.1 E.	June	3	10.0 E.		6	5.8 E.		8	1.7 E.		9	21.9 E.
Apr.	1	11.6 E.		4	7.8 E.		6	3.6 E.		8	23.4 E.		10	19.3 E.		12	15.6 E.
	4	5.3 E.		7	1.4 E.		8	21.3 E.		11	17.0 E.		13	13.0 E.		15	9.3 E.
	6	23.0 E.		9	19.1 E.		11	14.9 E.		14	10.7 E.		16	6.7 E.		18	3.0 E.
	9	16.7 E.		12	12.7 E.		14	8.6 E.		17	4.4 E.		19	0.3 E.		20	20.7 E.
	12	10.4 E.		15	6.4 E.		17	2.2 E.		19	22.0 E.		21	18.0 E.		23	14.4 E.
	15	4.1 E.		18	0.1 E.		19	19.8 E.		22	15.7 E.		24	11.7 E.		26	8.1 E.
	17	21.7 E.		20	17.7 E.		22	13.5 E.		25	9.3 E.		27	5.4 E.		29	1.9 E.
	20	15.4 E.		23	11.4 E.		25	7.2 E.		28	3.0 E.		29	23.1 E.	Oct.	1	19.6 E.
	23	9.1 E.		26	5.0 E.		28	0.8 E.		30	20.6 E.	Sept.	1	16.8 E.		4	13.3 E.

RHEA.

	d	h			d	h	
Apr.	3	12.3	E.	July	11	20.0	E.
	8	0.7	E.		16	8.3	E.
	12	13.2	E.		20	20.7	E.
	17	1.6	E.		25	9.0	E.
	21	14.0	E.		29	21.4	E.
	26	2.4	E.	Aug.	3	9.7	E.
	30	14.8	E.		7	22.1	E.
May	5	3.1	E.		12	10.5	E.
	9	15.5	E.		16	22.9	E.
	14	3.8	E.		21	11.3	E.
	18	16.2	E.		25	23.7	E.
	23	4.5	E.		30	12.1	E.
	27	16.8	E.	Sept.	4	0.5	E.
June	1	5.2	E.		8	13.0	E.
	5	17.5	E.		13	1.4	E.
	10	5.8	E.		17	13.9	E.
	14	18.1	E.		22	2.4	E.
	19	6.4	E.		26	14.9	E.
	23	18.7	E.	Oct.	1	3.4	E.
	28	7.1	E.		5	15.9	E.
July	2	19.4	E.		10	4.4	E.
	7	7.7	E.		14	16.9	E.

TITAN.

	d	h			d	h	
Apr.	9	15.7	E.	July	6	7.1	W.
	13	16.4	I.		10	5.1	S.
	17	18.4	W.		14	2.3	E.
	21	16.9	S.		18	3.1	I.
	25	14.2	E.		22	4.6	W.
	29	15.0	I.		26	2.6	S.
May	3	16.8	W.		29	23.9	E.
	7	15.1	S.	Aug.	3	0.8	I.
	11	12.3	E.		7	2.4	W.
	15	13.0	I.		11	0.5	S.
	19	14.7	W.		14	22.0	E.
	23	12.8	S.		18	22.9	I.
	27	10.2	E.		23	0.6	W.
	31	10.8	I.		26	22.6	S.
June	4	12.3	W.		30	20.5	E.
	8	10.4	S.	Sept.	3	21.7	I.
	12	7.7	E.		7	23.5	W.
	16	8.2	I.		11	21.6	S.
	20	9.8	W.		15	19.5	E.
	24	7.8	S.		19	20.8	I.
	28	4.8	E.		23	22.6	W.
July	2	5.5	I.		27	20.9	S.

HYPERION.

	d			d	
Mar.	15.8	E.	July	10.6	W.
	20.6	I.		16.5	S.
	26.0	W.		21.7	E.
	31.9	S.		26.5	I.
Apr.	6.2	E.		31.9	W.
	11.0	I.	Aug.	6.8	S.
	16.4	W.		12.0	E.
	22.3	S.		16.8	I.
	27.5	E.		22.2	W.
May	2.3	I.		28.2	S.
	7.7	W.	Sept.	2.4	E.
	13.6	S.		7.1	I.
	18.9	E.		12.6	W.
	23.6	I.		18.5	S.
	29.0	W.		23.7	E.
June	3.9	S.		28.5	I.
	9.2	E.	Oct.	4.0	W.
	13.9	I.		9.9	S.
	19.4	W.		15.1	E.
	25.2	S.		19.9	I.
	30.4	E.		25.4	W.
July	5.2	I.		31.3	S.

IAPETUS.

	d			d			d			d			d			d	
Mar.	25.9	I.	May	6.0	S.	June	12.7	I.	July	23.0	S.	Aug.	30.0	I.	Oct.	10.4	S.
Apr.	15.6	W.		24.8	E.	July	2.9	W.	Aug.	10.9	E.	Sept.	19.7	W.		29.8	E.

THE APPARENT ELEMENTS OF SATURN'S RINGS.

Greenwich Mean Noon.		a Outer Major Axis.	b Outer Minor Axis.	p Inclination of Northern Semi-Axis Minor to Circle of Declination from North to East.	l The Elevation of the Earth above the Plane of the Ring.	l' The Elevation of the Sun above the Plane of the Ring.	u Earth's Longitude from Saturn counted on Plane of Ring from the Ring's Ascending Node on the—	u'
							Equator.	Ecliptic.
		″	″	° ′	° ′	° ′	° ′	° ′
Jan.	0	34.02	15.31	+ 6 0.1	+ 26 44.9	+ 26 44.9	322 53.2	280 37.4
	20	34.39	15.37	+ 6 11.8	+ 26 32.4	+ 26 43.2	325 23.5	283 7.9
Feb.	9	35.07	15.55	+ 6 21.6	+ 26 18.7	+ 26 41.8	327 36.3	285 20.8
Mar.	1	36.02	15.84	+ 6 28.5	+ 26 5.7	+ 26 39.7	329 22.0	287 6.5
	21	37.17	16.26	+ 6 33.1	+ 25 56.1	+ 26 37.6	330 32.4	288 17.0
Apr.	10	38.43	16.76	+ 6 34.9	+ 25 51.4	+ 26 35.9	331 2.0	288 46.7
	30	39.66	17.31	+ 6 34.0	+ 25 52.9	+ 26 33.4	330 48.6	288 33.4
May	20	40.67	17.83	+ 6 30.6	+ 25 59.9	+ 26 30.8	329 55.6	287 40.6
June	9	41.29	18.22	+ 6 25.2	+ 26 11.0	+ 26 28.0	328 32.8	286 17.9
	29	41.41	18.41	+ 6 18.6	+ 26 23.4	+ 26 24.9	326 56.4	284 41.6
July	19	41.00	18.38	+ 6 11.9	+ 26 34.9	+ 26 21.7	325 25.3	283 10.6
Aug.	8	40.14	18.06	+ 6 6.9	+ 26 44.0	+ 26 18.2	324 17.4	282 2.7
	28	38.99	17.60	+ 6 4.5	+ 26 49.8	+ 26 15.0	323 45.6	281 31.1
Sept.	17	37.74	17.05	+ 6 5.6	+ 26 52.1	+ 26 10.9	323 56.4	281 41.9
Oct.	7	36.52	16.49	+ 6 9.8	+ 26 50.4	+ 26 7.2	324 49.7	282 35.2
	27	35.48	15.96	+ 6 16.7	+ 26 44.2	+ 26 3.1	326 20.6	284 6.2
Nov.	16	34.67	15.50	+ 6 25.4	+ 26 33.1	+ 25 59.0	328 22.2	286 8.0
Dec.	6	34.16	15.12	+ 6 34.8	+ 26 16.9	+ 25 54.5	330 44.6	288 30.5
	26	33.95	14.85	+ 6 44.1	+ 25 56.3	+ 25 50.0	333 17.8	291 3.9
	31	33.95	14.80	+ 6 46.3	+ 25 50.5	+ 25 48.7	333 56.6	291 42.8

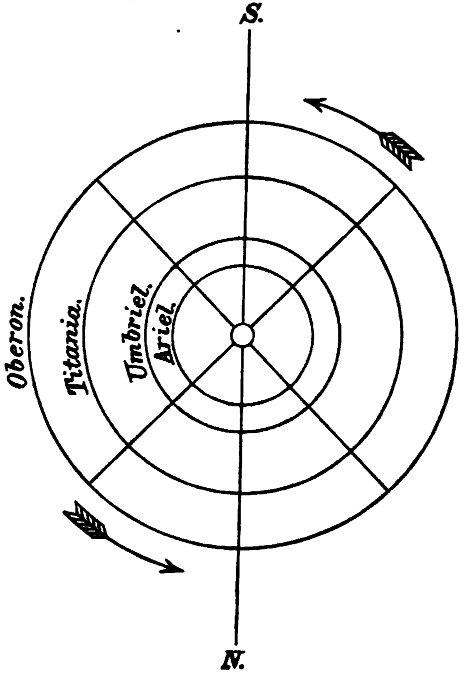
The factor to be multiplied by *a* and *b* to obtain the axes of—

The inner ellipse of the outer ring = 0.8801, log factor = 9.9445
The outer ellipse of the inner ring = 0.8599, log factor = 9.9344
The inner ellipse of the inner ring = 0.6650, log factor = 9.8228
The inner ellipse of the dusky ring = 0.5486, log factor = 9.7392

Note.—The positive sign of l indicates that the visible surface of the ring is the northern one.

Apparent Apsides.

Date.	Position Angle.	App. Distances. Ariel.	App. Distances. Umbriel.
	°	"	"
Mar. 12,	302.7	14.0	19.6
May 31,	313.9	14.7	20.5
Aug. 19,	323.6	14.1	19.6



Apparent Apsides.

Date.	Position Angle.	App. Distances. Titania.	App. Distances. Oberon.
	°	"	"
Mar. 12,	302.7	32.1	42.9
May 31,	313.9	33.5	44.9
Aug. 19,	323.6	32.2	43.0

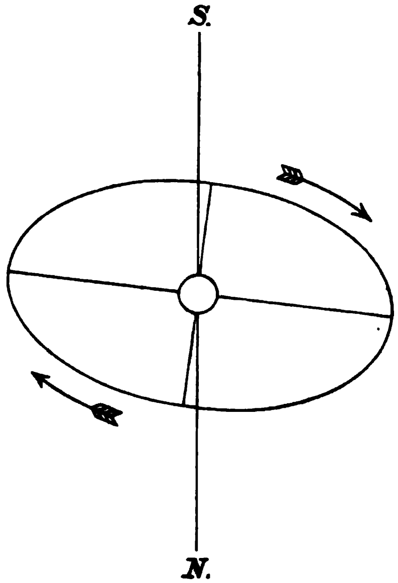
APPARENT ORBITS OF THE SATELLITES OF URANUS IN 1900, AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBERON.
North.	South.	North.	South.	North.	South.	North and South.
d h	d h	d h	d h	d h	d h	d h
Feb. 25 8.3	Mar. 1 3.0	Feb. 18 11.7	Feb. 20 13.4	Feb. 10 8.2	Feb. 14 16.3	Mar. 8 21.6 N.
Mar. 4 21.6	8 16.3	26 18.4	28 20.0	19 0.4	23 8.6	15 15.0 S.
12 11.0	16 5.7	Mar. 7 1.1	Mar. 9 2.8	27 16.8	Mar. 4 1.1	22 8.5 N.
20 0.4	23 19.2	15 7.9	17 9.7	Mar. 8 9.4	12 17.8	29 2.3 S.
27 13.9	31 8.7	23 14.8	25 16.6	17 2.2	21 10.6	Apr. 4 20.3 N.
Apr. 4 3.5	Apr. 7 22.3	31 21.9	Apr. 2 23.6	25 19.2	30 3.8	11 14.6 S.
11 17.1	15 11.9	Apr. 9 5.0	11 6.8	Apr. 3 12.4	Apr. 7 21.2	18 9.0 N.
19 6.7	23 1.6	17 12.2	19 14.0	12 5.9	16 14.7	25 3.5 S.
26 20.4	30 15.2	25 19.5	27 21.3	20 23.6	25 8.5	May 1 22.1 N.
May 4 10.1	May 8 4.9	May 4 2.8	May 6 4.7	29 17.4	May 4 2.3	8 16.8 S.
11 23.8	15 18.6	12 10.2	14 12.0	May 8 11.2	12 20.2	15 11.6 N.
19 13.5	23 8.4	20 17.5	22 19.4	17 5.2	21 14.1	22 6.3 S.
27 3.2	30 22.1	29 0.9	31 2.8	25 23.1	30 8.1	29 1.1 N.
June 3 16.9	June 7 11.8	June 6 8.3	June 8 10.1	June 3 17.0	June 8 2.0	June 4 19.8 S.
11 6.6	15 1.5	14 15.6	16 17.4	12 10.9	16 19.8	11 14.4 N.
18 20.3	22 15.2	22 22.9	25 0.7	21 4.7	25 13.6	18 9.1 S.
26 10.0	30 4.8	July 1 6.2	July 3 8.0	29 22.5	July 4 7.3	25 3.6 N.
July 3 23.7	July 7 18.5	9 13.4	11 15.2	July 8 16.1	13 0.8	July 1 22.1 S.
11 13.3	15 8.1	17 20.7	19 22.4	17 9.6	21 18.3	8 16.5 N.
19 2.9	22 21.7	26 3.7	28 5.5	26 3.0	30 11.6	15 10.7 S.
26 16.5	30 11.3	Aug. 3 10.8	Aug. 5 12.5	Aug. 3 20.2	Aug. 8 4.8	22 4.9 N.
Aug. 3 6.0	Aug. 7 0.8	11 17.8	13 19.5	12 13.3	16 21.8	28 22.9 S.
10 19.6	14 14.3	20 0.7	22 2.4	21 6.2	25 14.6	Aug. 4 16.8 N.
18 9.0	22 3.8	28 7.6	30 9.3	29 23.1	Sept. 3 7.4	11 10.4 S.
25 22.5	29 17.2	Sept. 5 14.5	Sept. 7 16.1	Sept. 7 15.8	12 0.0	18 4.0 N.
Sept. 2 12.0		13 21.2		16 8.3		24 21.5 S.
						31 14.9 N.

	d h		d h
Period of Ariel,	2 12.489	Period of Titania,	8 16.942
Period of Umbriel,	4 3.460	Period of Oberon,	13 11.119

NOTE.—For Ariel only every third elongation is given, and for Umbriel every alternate one. The intermediate ones may be found by adding multiples of the period of the satellite.



Date.	Position Angle of Apsis.	Apparent Distance at Apsis.
	°	″
Feb. 3,	260.3	+ 16.7
Sept. 27,	265.7	+ 16.4
Dec. 16,	274.2	+ 16.9

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE IN 1900, AS SEEN IN AN INVERTING TELESCOPE.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

East.			West.			East.			West.			East.			West.		
	d	h		d	h		d	h		d	h		d	h		d	h
Dec.	30	18.8	Jan.	2	17.3	Mar.	5	10.8	Mar.	8	9.4	Nov.	1	7.3	Nov.	4	5.8
Jan.	5	15.9		8	14.4		11	7.9					7	4.3		10	2.9
	11	13.0		14	11.5	Sept.	9	10.0	Sept.	12	8.6		13	1.4		16	0.0
	17	10.1		20	8.6		15	7.0		18	5.5		18	22.6		21	21.1
	23	7.2		26	5.7		21	4.0		24	2.5		24	19.7		27	18.3
	29	4.3	Feb.	1	2.8		27	1.0		29	23.6		30	16.9	Dec.	3	15.4
Feb.	4	1.4		6	24.0	Oct.	2	22.1	Oct.	5	20.6	Dec.	6	14.0		9	12.5
	9	22.5		12	21.1		8	19.1		11	17.6		12	11.0		15	9.6
	15	19.6		18	18.2		14	16.1		17	14.7		18	8.2		21	6.7
	21	16.7		24	15.2		20	13.2		23	11.7		24	5.3		27	3.9
	27	13.8	Mar.	2	12.3		26	10.2		29	8.7		30	2.4		33	1.0

The above times are those of each passage of the satellite through the apsis of its apparent orbit. The position of the satellite at any time may be found by measuring around the orbit from the apsis last passed through, remembering that the radius vector of the satellite describes equal areas in equal times.

Period of the satellite of Neptune, $5^d\,21^h.045$.

Note.—In the preceding diagrams the central circle represents the planet and is on the same scale as the orbits.

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m		°	′
Jan.	1	3	33	☌ ♂ ☾ .... ♂ −	3	8
	1	14	–	⊕ in Perihelion.		
	1	23	–	♀ Greatest Hel. Lat. S.		
	2	22	38	☌ ♀ ☾ .... ♀ −	6	0
	3	22	–	☌ ♃ β¹ Scorpii . . . * +	0	13
	7	8	–	☌ ☿ ♄ .... ☿ −	0	51
	8	13	–	☿ in ☋		
	12	15	17	☌ ♆ ☾ .... ♆ −	0	51
	15	12	–	☌ ♂ ☉		
	18	19	–	☿ in Aphelion.		
	25	19	42	☌ ♃ ☾ .... ♃ +	2	3
	26	5	30	☌ ♅ ☾ .... ♅ +	0	46
	27	14	54	☌ ♄ ☾ .... ♄ −	0	2
	29	22	18	☌ ☿ ☾ .... ☿ −	5	44
	30	4	34	☌ ♂ ☾ .... ♂ −	5	6
Feb.	1	2	–	☌ ♀ φ Aquarii . . . * +	0	13
	1	21	17	☌ ♀ ☾ .... ♀ −	6	52
	2	21	–	☌ ☿ ♂ .... ☿ −	1	2
	8	4	–	☿ Greatest Hel. Lat. S.		
	8	19	55	☌ ♆ ☾ .... ♆ −	0	45
	9	3	–	☌ ☿ ☉ Superior.		
	21	16	–	♂ Greatest Hel. Lat. S.		
	22	10	27	☌ ♃ ☾ .... ♃ +	1	31
	22	15	41	☌ ♅ ☾ .... ♅ +	0	27
	24	4	59	☌ ♄ ☾ .... ♄ −	0	26
	27	4	–	☿ in ☊		
	27	6	–	♀ in ☊		
	28	1	–	□ ♃ ☉		
	28	5	29	☌ ♂ ☾ .... ♂ −	6	21
Mar.	2	1	9	☌ ☿ ☾ .... ☿ −	4	37
	2	17	–	□ ♅ ☉		
	3	15	18	☌ ♀ ☾ .... ♀ −	3	58
	3	18	–	☿ in Perihelion.		
	5	2	–	♆ Stationary.		
	7	18	–	☿ Greatest elong. E.	18	16
	8	1	38	☌ ♆ ☾ .... ♆ −	0	29
	14	1	–	☿ Greatest Hel. Lat. N.		
	14	10	–	☿ Stationary.		
	14	13	–	□ ♆ ☉		
	17	3	–	♅ Stationary.		
	18	2	–	♂ in Perihelion.		
	20	8	–	☉ enters ♈, Spring com.		
	21	19	45	☌ ♃ ☾ .... ♃ +	1	8
	21	22	34	☌ ♅ ☾ .... ♅ +	0	10
	23	15	17	☌ ♄ ☾ .... ♄ −	0	49
	24	10	–	☌ ☿ ☉ Inferior.		
	25	3	–	□ ♄ ☉		
	27	7	–	♃ Stationary.		
	29	4	45	☌ ♂ ☾ .... ♂ −	6	29
	29	13	36	☌ ☿ ☾ .... ☿ −	2	58
Apr.	1	15	–	♀ in Perihelion.		
	2	7	50	☌ ♀ ☾ .... ♀ +	0	46
Apr.	2	22	–	☌ ☿ ♂ .... ☿ +	2	7
	4	9	53	☌ ♆ ☾ .... ♆ −	0	11
	5	21	–	☿ Stationary.		
	6	13	–	☿ in ☋		
	13	15	–	♄ Stationary.		
	16	17	–	☿ in Aphelion.		
	17	23	57	☌ ♃ ☾ .... ♃ +	1	3
	18	3	16	☌ ♅ ☾ .... ♅ +	0	1
	19	21	39	☌ ♄ ☾ .... ♄ −	1	3
	21	9	–	☿ Greatest elong. W.	27	19
	23	18	–	♀ Greatest Hel. Lat. N.		
	26	19	27	☌ ☿ ☾ .... ☿ −	7	53
	27	1	45	☌ ♂ ☾ .... ♂ −	5	29
	28	9	–	♀ Greatest elong. E.	45	35
	29	20	–	☌ ♀ ♆ .... ♀ +	4	39
May	1	20	23	☌ ♆ ☾ .... ♆ +	0	3
	2	0	6	☌ ♀ ☾ .... ♀ +	4	55
	3	11	–	☌ ☿ ♂ .... ☿ −	2	10
	7	3	–	☿ Greatest Hel. Lat. S.		
	15	1	23	☌ ♃ ☾ .... ♃ +	1	13
	15	7	46	☌ ♅ ☾ .... ♅ +	0	2
	17	1	45	☌ ♄ ☾ .... ♄ −	1	4
	25	20	44	☌ ♂ ☾ .... ♂ −	3	41
	26	3	–	☿ in ☊		
	27	2	–	☍ ♃ ☉		
	27	17	33	☌ ☿ ☾ .... ☿ −	0	20
	28	–	–	☉ Total eclip. vis. at Wash.		
	29	7	35	☌ ♆ ☾ .... ♆ +	0	10
	29	14	–	☌ ☿ ☉ Superior.		
	30	18	–	☿ in Perihelion.		
	31	4	31	☌ ♀ ☾ .... ♀ +	6	5
	31	17	–	♀ Greatest brilliancy.		
	31	18	–	☍ ♅ ☉		
June	6	22	–	☌ ☿ ♆ .... ☿ +	2	54
	10	1	--	☿ Greatest Hel. Lat. N.		
	11	3	8	☌ ♃ ☾ .... ♃ +	1	29
	11	13	31	☌ ♅ ☾ .... ♅ +	0	8
	12	–	–	☾ Partial eclip. vis. at Wash.		
	13	2	–	☌ ☿ ε Geminorum * +	0	3
	13	5	46	☌ ♄ ☾ .... ♄ −	0	56
	15	9	–	♀ Stationary.		
	17	18	–	☌ ♆ ☉		
	18	19	–	♀ in ☋		
	21	4	–	☉ enters ♋, Summer com.		
	21	17	–	☌ ☿ ♀ .... ☿ +	2	19
	23	0	–	☍ ♄ ☉		
	23	14	29	☌ ♂ ☾ .... ♂ −	1	31
	25	17	54	☌ ♆ ☾ .... ♆ +	0	16
	27	15	26	☌ ♀ ☾ .... ♀ +	1	28
	28	14	0	☌ ☿ ☾ .... ☿ +	5	9
July	1	21	–	⊕ in Aphelion.		
	3	12	–	☿ in ☋		

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m			°	′
July	3	19	–	☿	Greatest elong. E.	26	1
	7	18	–	☌ ♀ ☉	Inferior.		
	8	7	35	☌ ♃ ☾	.... ♃ +	1	35
	8	20	48	☌ ♅ ☾	.... ♅ +	0	11
	9	11	–	♄	in Aphelion.		
	10	11	11	☌ ♄ ☾	.... ♄ −	0	54
	13	17	–	☿	in Aphelion.		
	16	23	–	☿	Stationary.		
	19	2	–	♂	in ☋		
	22	7	49	☌ ♂ ☾	.... ♂ +	0	45
	23	2	27	☌ ♆ ☾	.... ♆ +	0	23
	23	5	–	♀	in Aphelion.		
	23	20	50	☌ ♀ ☾	.... ♀ −	3	50
	26	14	10	☌ ☿ ☾	.... ☿ −	0	16
	28	15	–	♃	Stationary.		
	29	9	–	♀	Stationary.		
	31	15	–	☌ ☿ ☉	Inferior.		
Aug.	3	2	–	☿	Greatest Hel. Lat. S.		
	4	15	30	☌ ♃ ☾	.... ♃ +	1	22
	5	4	59	☌ ♅ ☾	.... ♅ +	0	4
	6	18	19	☌ ♄ ☾	.... ♄ −	0	50
	7	0	–	☌ ♂ ♆	.... ♂ +	1	27
	10	9	–	☿	Stationary.		
	13	20	–	♀	Greatest brilliancy.		
	14	16	–	♀	Greatest Hel. Lat. S.		
	17	2	–	♅	Stationary.		
	18	22	–	☿	Greatest elong. W.	18	32
	19	9	27	☌ ♆ ☾	.... ♆ +	0	36
	20	1	14	☌ ♂ ☾	.... ♂ +	2	55
	20	16	41	☌ ♀ ☾	.... ♀ −	1	49
	22	3	–	☿	in ☊		
	22	23	48	☌ ☿ ☾	.... ☿ +	4	59
	25	4	–	□ ♃ ☉			
	26	17	–	☿	in Perihelion.		
	31	18	–	□ ♅ ☉			
Sept.	1	2	27	☌ ♃ ☾	.... ♃ +	0	51
	1	13	10	☌ ♅ ☾	.... ♅ −	0	12
	2	0	–	♄	Stationary.		
	3	2	26	☌ ♄ ☾	.... ♄ −	1	5
	6	0	–	☿	Greatest Hel. Lat. N.		
	13	0	–	☌ ☿ ☉	Superior.		
	15	16	0	☌ ♆ ☾	.... ♆ +	0	52
	16	14	–	♀	Greatest elong. W.	46	3
	17	18	38	☌ ♂ ☾	.... ♂ +	4	53
	19	0	7	☌ ♀ ☾	.... ♀ +	2	50
	21	12	–	□ ♄ ☉			
	22	1	–	□ ♆ ☉			
	22	19	–	☉	enters ♎, Autumn com.		
	24	2	38	☌ ☿ ☾	.... ☿ +	4	59
	28	15	41	☌ ♃ ☾	.... ♃ +	0	13
	28	20	58	☌ ♅ ☾	.... ♅ −	0	30
Sept.	29	11	–	☿	in ☋		
	30	11	5	☌ ♄ ☾	.... ♄ −	1	28
Oct.	2	0	–	♆	Stationary.		
	9	16	–	☿	in Aphelion.		
	9	22	–	♀	in ☊		
	12	23	30	☌ ♆ ☾	.... ♆ +	1	5
	16	10	56	☌ ♂ ☾	.... ♂ +	6	29
	19	1	41	☌ ♀ ☾	.... ♀ +	6	11
	19	5	–	☌ ♃ ♅	.... ♃ +	0	25
	24	21	41	☌ ☿ ☾	.... ☿ −	2	1
	26	4	53	☌ ♅ ☾	.... ♅ −	0	45
	26	6	52	☌ ♃ ☾	.... ♃ −	0	27
	27	20	17	☌ ♄ ☾	.... ♄ −	1	50
	29	11	–	☿	Greatest elong. E.	23	44
	30	2	–	☿	Greatest Hel. Lat. S.		
Nov.	6	0	–	☌ ♀ η	Virginis . . . * −	0	13
	9	8	25	☌ ♆ ☾	.... ♆ +	1	9
	9	11	–	☿	Stationary.		
	12	13	–	♀	in Perihelion.		
	14	0	16	☌ ♂ ☾	.... ♂ +	7	39
	18	2	–	☿	in ☊		
	18	8	5	☌ ♀ ☾	.... ♀ +	5	52
	19	19	–	☌ ☿ ☉	Inferior.		
	21	7	29	☌ ☿ ☾	.... ☿ +	1	39
	21	14	–	□ ♂ ☉			
	21	–	–	☉	Ann. eclip. invis. at Wash.		
	22	13	55	☌ ♅ ☾	.... ♅ −	0	55
	22	16	–	☿	in Perihelion.		
	23	0	7	☌ ♃ ☾	.... ♃ −	1	3
	24	6	53	☌ ♄ ☾	.... ♄ −	2	8
	29	2	–	☿	Stationary.		
Dec.	2	23	–	☿	Greatest Hel. Lat. N.		
	4	11	–	♀	Greatest Hel. Lat. N.		
	4	14	–	☌ ♅ ☉			
	6	17	49	☌ ♆ ☾	.... ♆ +	1	6
	7	10	–	☿	Greatest elong. W.	20	50
	12	7	26	☌ ♂ ☾	.... ♂ +	8	26
	13	16	–	☌ ♃ ☉			
	15	21	–	☌ ♂ *l*	Leonis . . . * +	0	6
	18	14	11	☌ ♀ ☾	.... ♀ +	2	19
	19	11	–	☍ ♆ ☉			
	19	19	14	☌ ☿ ☾	.... ☿ +	0	2
	20	0	39	☌ ♅ ☾	.... ♅ −	1	4
	20	19	23	☌ ♃ ☾	.... ♃ −	1	38
	21	13	–	☉	enters ♑, Winter com.		
	21	19	41	☌ ♄ ☾	.... ♄ −	2	24
	21	22	–	☌ ☿ ♅	.... ☿ +	0	34
	26	10	–	☿	in ☋		
	28	20	–	☌ ♄ ☉			
	29	23	–	☌ ☿ ♃	.... ☿ −	0	44

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude.	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Abastuman	+41 42 24	− 11 35.5	9.999351	− 7 59 41	− 2 51 25
Åbo	+60 26 56.8	− 10 2.1	9.998887	− 6 37 22.12	− 1 29 6.41
Adelaide	−34 55 38.5	+ 10 56.8	9.999520	−14 22 36.01	− 9 14 20.30
Albany (*New Obs.*)	+42 39 12.7	− 11 38.0	9.999326	− 0 13 8.9	+ 4 55 6.8
Albany (*Old Obs.*)	+42 39 49.5	− 11 38.0	9.999326	− 0 13 16.49	+ 4 54 59.22
Alfred (*N. Y.*)	+42 15 19.8	− 11 37.0	9.999337	+ 0 2 51.33	+ 5 11 7.04
Algiers (*Old Obs.*)	+36 44 0	− 11 10.8	9.999476	− 5 20 32.5	− 0 12 16.8
Algiers (*New Obs.*)	+36 47 50	− 11 11.3	9.999474	− 5 20 24.26	− 0 12 8.55
Allegheny	+40 27 41.6	− 11 31.3	9.999383	+ 0 11 47.22	+ 5 20 2.93
Altona	+53 32 45.3	− 11 10.2	9.999049	− 5 48 2.06	− 0 39 46.35
Amherst	+42 22 17.1	− 11 37.3	9.999334	− 0 18 11.04	+ 4 50 4.67
Annapolis	+38 58 53.5	− 11 24.5	9.999420	− 0 2 19.22	+ 5 5 56.49
Ann Arbor	+42 16 48.0	− 11 37.0	9.999336	+ 0 26 39.48	+ 5 34 55.19
Arequipa (*Harvard*)	−16 24	+ 6 18.4	9.999884	− 0 22 46	+ 4 45 30
Armagh	+54 21 12.7	− 11 4.2	9.999029	− 4 41 40.3	+ 0 26 35.4
Athens	+37 58 20.7	− 11 18.9	9.999445	− 6 43 8.6	− 1 34 52.9
Bamberg	+49 53 6.0	− 11 30.7	9.999141	− 5 51 49.36	− 0 43 33.65
Beloit	+42 30 8.4	− 11 37.6	9.999331	+ 0 47 51.7	+ 5 56 7.4
Bergen	+60 23 54	− 10 2.7	9.998888	− 5 29 28.8	− 0 21 13.1
Berkeley	+37 52 23.6	− 11 18.3	9.999448	+ 3 0 47.01	+ 8 9 2.72
Berlin	+52 30 16.7	− 11 17.1	9.999075	− 6 1 50.62	− 0 53 34.91
Berlin (*Urania*)	+52 31 30.7	− 11 17.0	9.999075	− 6 1 43.22	− 0 53 27.51
Berne	+46 57 8.7	− 11 39.0	9.999216	− 5 38 1.4	− 0 29 45.7
Besançon	+47 14 59.0	− 11 38.5	9.999208	− 5 32 12.8	− 0 23 57.1
Bethlehem	+40 36 23.4	− 11 31.9	9.999379	− 0 6 43.86	+ 5 1 31.85
Birr Castle	+53 5 47.0	− 11 13.3	9.999060	− 4 36 34.8	+ 0 31 40.9
Bogota	+ 4 35 48	− 1 51.5	9.999991	− 0 11 17	+ 4 56 59
Bologna	+44 29 47.0	− 11 40.3	9.999279	− 5 53 40.6	− 0 45 24.9
Bombay	+18 53 45	− 7 8.1	9.999847	− 9 59 31.45	− 4 51 15.74
Bonn	+50 43 45.0	− 11 26.9	9.999120	− 5 36 39.00	− 0 28 23.29
Bordeaux	+44 50 7.2	− 11 40.4	9.999271	− 5 6 10.17	+ 0 2 5.54
Boston (*University*)	+42 21 32.5	− 11 37.2	9.999334	− 0 24 0.7	+ 4 44 15.0
Bothkamp	+54 12 9.6	− 11 5.3	9.999033	− 5 48 46.9	− 0 40 31.2
Breslau	+51 6 55.8	− 11 25.0	9.999110	− 6 16 24.55	− 1 8 8.84
Brisbane	−27 28 0.0	+ 9 32.2	9.999689	−15 20 22.11	−10 12 6.40
Brussels (*Uccle*)	+50 47 53	− 11 26.6	9.999118	− 5 25 42.6	− 0 17 26.9
Brussels (*Old Obs.*)	+50 51 10.7	− 11 26.3	9.999117	− 5 25 44.6	− 0 17 28.9
Budapest	+47 29 34.7	− 11 38.0	9.999202	− 6 24 31.1	− 1 16 15.4
Cairo	+30 4 38.2	− 10 6.5	9.999632	− 7 13 24.62	− 2 5 8.91
Cambridge (*England*)	+52 12 51.6	− 11 18.9	9.999082	− 5 8 38.46	− 0 0 22.75
Cambridge (*Mass.*)	+42 22 47.6	− 11 37.3	9.999334	− 0 23 44.72	+ 4 44 30.99
Cape of Good Hope	−33 56 3.6	+ 10 48.0	9.999543	− 6 22 10.47	− 1 13 54.76
Catania	+37 30 13.3	− 11 16.0	9.999457	− 6 8 35	− 1 0 19
Chapultepec	+19 25 17.5	− 7 18.2	9.999838	+ 1 28 22.53	+ 6 36 38.24
Charkow	+50 0 9.6	− 11 30.2	9.999138	− 7 33 11.48	− 2 24 55.77

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude.	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Charlottesville	+38 2 1.2	− 11 19.3	9.999444	+ 0 5 49.51	+ 5 14 5.22
Chicago (*Old Obs.*)	+41 50 1.0	− 11 35.9	9.999348	+ 0 42 11.02	+ 5 50 26.73
Christiania	+59 54 44.0	− 10 8.7	9.998899	− 5 51 9.29	− 0 42 53.58
Cincinnati (*New Obs.*)	+39 8 19.5	− 11 25.4	9.999416	+ 0 29 25.58	+ 5 37 41.29
Cincinnati (*Old Obs.*)	+39 6 26.5	− 11 25.2	9.999417	+ 0 29 43.34	+ 5 37 59.05
Clinton	+43 3 17.0	− 11 38.7	9.999316	− 0 6 38.26	+ 5 1 37.45
Coimbra	+40 12 24.5	− 11 30.3	9.999389	− 4 34 32.6	+ 0 33 43.1
Columbia (*Missouri*)	+38 56 51.7	− 11 24.4	9.999421	+ 1 1 2.62	+ 6 9 18.33
Copenhagen	+55 41 12.9	− 10 53.1	9.998997	− 5 58 34.47	− 0 50 18.76
Cordoba	−31 25 15.2	+ 10 22.2	9.999602	− 0 51 27.5	+ 4 16 48.2
Cracow	+50 3 52.0	− 11 29.9	9.999137	− 6 28 6.08	− 1 19 50.37
Crowborough	+51 3 6.5	− 11 25.4	9.999112	− 5 8 53.0	− 0 0 37.3
Dantzig	+54 21 18.0	− 11 4.1	9.999029	− 6 22 55.3	− 1 14 39.6
Denver	+39 40 36.4	− 11 27.9	9.999402	+ 1 51 31.92	+ 6 59 47.63
Dorpat	+58 22 47.1	− 10 26.4	9.998934	− 6 55 9.06	− 1 46 53.35
Dresden	+51 2 16.8	− 11 25.4	9.999112	− 6 3 10.55	− 0 54 54.84
Dublin	+53 23 13.1	− 11 11.3	9.999053	− 4 42 54.6	+ 0 25 21.1
Dun Echt	+57 9 36	− 10 39.2	9.998962	− 4 58 35.7	+ 0 9 40.0
Durham	+54 46 6.2	− 11 0.9	9.999019	− 5 1 55.96	+ 0 6 19.75
Düsseldorf	+51 12 25.0	− 11 24.6	9.999108	− 5 35 20.7	− 0 27 5.0
Edinburgh (*Royal Obs.*)	+55 55 28.0	− 10 50.9	9.998991	− 4 55 31.5	+ 0 12 44.2
Evanston (*Dearborn*)	+42 3 33.4	− 11 36.5	9.999342	+ 0 42 26.6	+ 5 50 42.3
Florence (*Reale Museo*)	+43 46 4.1	− 11 39.7	9.999298	− 5 53 17.2	− 0 45 1.5
Florence (*Arcetri*)	+43 45 14.6	− 11 39.7	9.999298	− 5 53 17.11	− 0 45 1.40
Geneva	+46 11 58.8	− 11 39.9	9.999236	− 5 32 52.48	− 0 24 36.77
Genoa	+44 25 9.3	− 11 40.2	9.999281	− 5 43 57.1	− 0 35 41.4
Georgetown	+38 54 26.0	− 11 24.2	9.999422	+ 0 0 2.53	+ 5 8 18.24
Glasgow (*Missouri*)	+39 13 45.6	− 11 25.8	9.999414	+ 1 3 2.26	+ 6 11 17.97
Glasgow (*Scotland*)	+55 52 42.8	− 10 51.5	9.998993	− 4 51 5.16	+ 0 17 10.55
Gohlis	+51 21 35.0	− 11 23.7	9.999104	− 5 57 45.36	− 0 49 29.65
Gotha (*Old Obs.*)	+50 56 5.2	− 11 26.0	9.999114	− 5 51 10.87	− 0 42 55.16
Gotha	+50 56 37.9	− 11 25.9	9.999114	− 5 51 6.27	− 0 42 50.56
Göttingen	+51 31 48.2	− 11 22.8	9.999100	− 5 48 2.05	− 0 39 46.34
Graz	+47 4 37.2	− 11 38.8	9.999213	− 6 10 4	− 1 1 48
Greenwich	+51 28 38.1	− 11 23.1	9.999101	− 5 8 15.71	0 0 0.00
Grignon	+47 33 42	− 11 37.8	9.999201	− 5 25 54	− 0 17 38
Hamburg	+53 33 7.0	− 11 10.1	9.999049	− 5 48 9.4	− 0 39 53.8
Hanover	+43 42 15.3	− 11 39.6	9.999300	− 0 19 7.80	+ 4 49 7.91
Harrow	+51 34 47.1	− 11 22.6	9.999098	− 5 6 55.85	+ 0 1 19.86
Hastings-on-Hudson	+40 59 25	− 11 33.2	9.999369	− 0 12 46.1	+ 4 55 29.6
Haverford	+40 0 40.1	− 11 29.4	9.999394	− 0 7 3.01	+ 5 1 12.70
Heidelberg	+49 24 35	− 11 32.5	9.999153	− 5 43 4.2	− 0 34 48.5
Helsingfors	+60 9 42.6	− 10 5.6	9.998893	− 6 48 4.85	− 1 39 49.14
Hereny	+47 15 47.4	− 11 38.4	9.999208	− 6 14 40.4	− 1 6 24.7
Hongkong	+22 18 13.4	− 8 10.7	9.999789	−12 44 57.57	− 7 36 41.86

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude.	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Hudson	+41 14 42.6	− 11 34.1	9.999363	+ 0 17 28.45	+ 5 25 44.16
Jamaica	+18 24 51	− 6 58.7	9.999854	+ 0 3 13.77	+ 5 11 29.48
Jena (*University*)	+50 55 34.9	− 11 26.0	9.999115	− 5 54 36.0	− 0 46 20.3
Kalocsa	+46 31 41.7	− 11 39.6	9.999227	− 6 24 10.0	− 1 15 54.3
Karlsruhe	+49 0 29.6	− 11 33.9	9.999163	− 5 41 52.2	− 0 33 36.5
Kasan	+55 47 24.4	− 10 52.2	9.998995	− 8 24 44.78	− 3 16 29.07
Kew	+51 28 6	− 11 23.2	9.999101	− 5 7 0.6	+ 0 1 15.1
Kiel	+54 20 28.5	− 11 4.2	9.999030	− 5 48 51.40	− 0 40 35.69
Kiew	+50 27 10.5	− 11 28.2	9.999127	− 7 10 16.44	− 2 2 0.73
Kis Kartal	+47 41 54.8	− 11 37.5	9.999197	− 6 26 27.4	− 1 18 11.7
Königsberg	+54 42 50.4	− 11 1.3	9.999021	− 6 30 14.74	− 1 21 59.03
Kremsmünster	+48 3 23.1	− 11 36.7	9.999188	− 6 4 47.35	− 0 56 31.64
La Plata	−34 54 30.3	+ 10 56.7	9.999520	− 1 16 38.7	+ 3 51 37.0
Leiden	+52 9 20.0	− 11 19.3	9.999084	− 5 26 11.93	− 0 17 56.22
Leipzig	+51 20 5.9	− 11 23.9	9.999104	− 5 57 49.73	− 0 49 34.02
Liege (*Ougrée*)	+50 37 7	− 11 27.5	9.999123	− 5 30 30.9	− 0 22 15.2
Lisbon (*Marine Obs.*)	+38 42 17.6	− 11 23.3	9.999427	− 4 31 42.2	+ 0 36 33.5
Lisbon (*Royal Obs.*)	+38 42 31.3	− 11 23.1	9.999427	− 4 31 31.03	+ 0 36 44.68
Liverpool	+53 24 4.8	− 11 11.2	9.999053	− 4 55 58.38	+ 0 12 17.33
Lübec	+53 51 31.1	− 11 7.9	9.999042	− 5 51 1.4	− 0 42 45.7
Lund	+55 41 51.6	− 10 53.0	9.998997	− 6 1 0.85	− 0 52 45.14
Lussinpiccolo (*Manora*)	+44 32 11	− 11 40.3	9.999278	− 6 6 8.12	− 0 57 52.41
Lyons	+45 41 40.9	− 11 40.3	9.999248	− 5 27 24.33	− 0 19 8.62
Madison	+43 4 36.7	− 11 38.7	9.999316	+ 0 49 22.15	+ 5 57 37.86
Madras	+13 4 8.1	− 5 7.6	9.999925	−10 29 15.06	− 5 20 59.35
Madrid	+40 24 29.7	− 11 31.1	9.999384	− 4 53 30.7	+ 0 14 45.0
Manilla	+14 35 25	− 5 40.5	9.999907	−13 12 6	− 8 3 50
Mannheim	+49 29 11.0	− 11 32.2	9.999151	− 5 42 6.23	− 0 33 50.52
Marburg	+50 48 46.9	− 11 26.5	9.999118	− 5 43 20.7	− 0 35 5.0
Markree	+54 10 31.8	− 11 5.5	9.999034	− 4 34 27.3	+ 0 33 48.4
Marseilles	+43 18 17.5	− 11 39.1	9.999310	− 5 29 50.35	− 0 21 34.64
Mauritius	−20 5 39	+ 7 30.8	9.999828	− 8 58 28.3	− 3 50 12.6
Melbourne	−37 49 53.2	+ 11 18.1	9.999449	−14 48 9.86	− 9 39 54.15
Meudon	+48 48 18	− 11 34.6	9.999169	− 5 17 11.3	− 0 8 55.6
Mexico	+19 26 1.3	− 7 18.4	9.999838	+ 1 28 10.96	+ 6 36 26.67
Middletown (*Conn.*)	+41 33 16.0	− 11 35.1	9.999355	− 0 17 38.53	+ 4 50 37.18
Milan	+45 27 59.3	− 11 40.4	9.999254	− 5 45 1.66	− 0 36 45.95
Modena	+44 38 52.8	− 11 40.4	9.999275	− 5 51 58.6	− 0 43 42.9
Moncalieri	+44 59 51	− 11 40.4	9.999266	− 5 39 5	− 0 30 49
Montreal	+45 30 17.0	− 11 40.4	9.999253	− 0 13 57.06	+ 4 54 18.65
Montsouris	+48 49 18.0	− 11 34.5	9.999168	− 5 17 36.39	− 0 9 20.68
Moscow	+55 45 19.8	− 10 52.5	9.998995	− 7 38 32.88	− 2 30 17.17
Mount Hamilton	+37 20 25.6	− 11 14.9	9.999461	+ 2 58 19.10	+ 8 6 34.81
Munich	+48 8 45.5	− 11 36.5	9.999186	− 5 54 41.91	− 0 46 26.20
Naples	+40 51 46.0	− 11 32.8	9.999372	− 6 5 17.50	− 0 57 1.79

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude.	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
Nashville	+36 8 54.4	– 11 6.6	9.999490	+ 0 38 56.5	+ 5 47 12.2
Natal	–29 50 46.6	+ 10 3.7	9.999637	– 7 12 16.89	– 2 4 1.18
Neuchatel	+47 0 1.2	– 11 38.9	9.999215	– 5 36 5.57	– 0 27 49.86
New Haven (*Old Obs.*)	+41 18 36.5	– 11 34.3	9.999361	– 0 16 33.57	+ 4 51 42.14
New Haven (*Yale Univ.*)	+41 19 22.3	– 11 34.4	9.999361	– 0 16 35.15	+ 4 51 40.56
New York (*Columb. Coll.*)	+40 45 23.1	– 11 32.4	9.999375	– 0 12 22.07	+ 4 55 53.64
New York (RUTHERFURD)	+40 43 48.5	– 11 32.3	9.999376	– 0 12 19	+ 4 55 57
Nice	+43 43 16.9	– 11 39.6	9.999299	– 5 37 27.96	– 0 29 12.25
Nicolaeff	+46 58 21.8	– 11 38.9	9.999216	– 7 16 9.51	– 2 7 53.80
Northfield	+44 27 41.6	– 11 40.3	9.999280	+ 1 4 20.10	+ 6 12 35.81
Oakland (*Cal.*)	+37 48 5	– 11 17.9	9.999449	+ 3 0 50.84	+ 8 9 6.55
Odessa	+46 28 36.7	– 11 39.6	9.999228	– 7 11 17.87	– 2 3 2.16
Ogden	+41 13 8.6	– 11 34.0	9.999363	+ 2 19 43.85	+ 7 27 59.56
O-Gyalla	+47 52 27.3	– 11 37.1	9.999192	– 6 21 1.31	– 1 12 45.60
Olmütz	+49 35 43	– 11 31.8	9.999149	– 6 17 24	– 1 9 8
Oxford (*Mississippi*)	+34 22 12.6	– 10 52.0	9.999533	+ 0 49 51.4	+ 5 58 7.1
Oxford (*Radcliffe*)	+51 45 35.4	– 11 21.6	9.999094	– 5 3 13.1	+ 0 5 2.6
Oxford (*University*)	+51 45 34.2	– 11 21.6	9.999094	– 5 3 15.3	+ 0 5 0.4
Padua	+45 24 2.5	– 11 40.4	9.999256	– 5 55 44.91	– 0 47 29.20
Palermo	+38 6 44.0	– 11 19.7	9.999442	– 6 1 41.68	– 0 53 25.97
Paramatta	–33 48 49.8	+ 10 46.9	9.999546	–15 12 15.9	–10 4 0.2
Paris	+48 50 11.2	– 11 34.5	9.999168	– 5 17 36.74	– 0 9 21.03
Philadelphia	+39 57 7.5	– 11 29.2	9.999396	– 0 7 37.25	+ 5 0 38.46
Plonsk	+52 37 40.0	– 11 16.4	9.999072	– 6 29 47.7	– 1 21 32.0
Pola	+44 51 48.7	– 11 40.4	9.999270	– 6 3 38.65	– 0 55 22.94
Portsmouth	+50 48 3	– 11 26.6	9.999118	– 5 3 50.9	+ 0 4 24.8
Potsdam	+52 22 56.0	– 11 17.9	9.999078	– 6 0 31.6	– 0 52 15.9
Poughkeepsie	+41 41 18	– 11 35.5	9.999351	– 0 12 42.1	+ 4 55 33.6
Prague (*University*)	+50 5 15.8	– 11 29.8	9.999136	– 6 5 56.0	– 0 57 40.3
Princeton	+40 20 57.8	– 11 30.8	9.999385	– 0 9 38.21	+ 4 58 37.50
Princeton (*Halsted*)	+40 20 55.8	– 11 30.9	9.999386	– 0 9 36.27	+ 4 58 39.44
Providence (SEAGRAVE)	+41 49 46	– 11 35.9	9.999348	– 0 22 38.19	+ 4 45 37.52
Providence (*Ladd*)	+41 50 21	– 11 35.9	9.999348	– 0 22 39.76	+ 4 45 35.95
Pulkowa	+59 46 18.7	– 10 10.4	9.998902	– 7 9 34.38	– 2 1 18.67
Quebec	+46 47 59.2	– 11 39.2	9.999220	– 0 23 23.07	+ 4 44 52.64
Quito	– 0 14 0	+ 0 5.7	0.000000	+ 0 5 50.95	+ 5 14 6.66
Riga	+56 57 9.3	– 10 41.3	9.998967	– 6 44 43.88	– 1 36 28.17
Rio de Janeiro	–22 54 23.7	+ 8 21.1	9.999779	– 2 15 34.3	+ 2 52 41.4
Rochester	+43 9 16.8	– 11 38.8	9.999314	+ 0 2 6.07	+ 5 10 21.78
Rome (*Coll. Rom.*)	+41 53 53.6	– 11 36.1	9.999346	– 5 58 11.26	– 0 49 55.55
Rome (*Capitol*)	+41 53 33.5	– 11 36.0	9.999346	– 5 58 12.14	– 0 49 56.43
Rome (*Vatican*)	+41 54 4.8	– 11 36.1	9.999346	– 5 58 5.1	– 0 49 49.4
Rousdon	+50 42 38	– 11 27.0	9.999120	– 4 56 16.77	+ 0 11 58.94
Rugby	+52 22 7	– 11 18.0	9.999079	– 5 3 13.7	+ 0 5 2.0
San Fernando	+36 27 42.0	– 11 8.9	9.999483	– 4 43 26.5	+ 0 24 49.2

POSITIONS OF OBSERVATORIES.

(*North Latitudes and West Longitudes are Considered Positive.*)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log ρ.	Longitude.	
				From Washington.	From Greenwich.
	° ′ ″	′ ″		h m s	h m s
San Francisco . .	+37 47 27.9	− 11 17.8	9.999450	+ 3 1 27.04	+ 8 9 42.75
Santiago de Chile .	−33 26 42.0	+ 10 43.4	9.999555	− 0 25 29.4	+ 4 42 46.3
Schwerin . . .	+53 37 37.9	− 11 9.6	9.999047	− 5 53 56.6	− 0 45 40.9
South Hadley . .	+42 15 18.2	− 11 37.0	9.999337	− 0 17 55.42	+ 4 50 20.29
Speier. . . .	+49 18 55.2	− 11 32.9	9.999156	− 5 42 1.33	− 0 33 45.62
St. Louis . . .	+38 38 3.0	− 11 22.7	9.999429	+ 0 52 33.45	+ 6 0 49.16
St. Petersburg (*Academy*)	+59 56 29.7	− 10 8.4	9.998898	− 7 9 29.17	− 2 1 13.46
St. Petersburg (*Univ.*)	+59 56 32.0	− 10 8.4	9.998898	− 7 9 27.12	− 2 1 11.41
Stockholm . . .	+59 20 33.0	− 10 15.5	9.998912	− 6 20 29.70	− 1 12 13.99
Stonyhurst . . .	+53 50 40	− 11 8.0	9.999042	− 4 58 23.03	+ 0 9 52.68
Strassburg (*New Obs.*)	+48 35 0.8	− 11 35.3	9.999174	− 5 39 20.36	− 0 31 4.65
Strassburg (*Old Obs.*).	+48 34 53.8	− 11 35.3	9.999174	− 5 39 18.20	− 0 31 2.49
Sydney . . .	−33 51 41.1	+ 10 47.3	9.999545	−15 13 5.25	−10 4 49.54
Syracuse . . .	+43 2 13.1	− 11 38.6	9.999317	− 0 3 42.35	+ 5 4 33.36
Tacubaya . . .	+19 24 17.5	− 7 17.8	9.999839	+ 1 28 30.82	+ 6 36 46.53
Taschkent . . .	+41 19 31.4	− 11 34.4	9.999361	− 9 45 26.51	− 4 37 10.80
Tokio	+35 39 17.5	− 11 2.8	9.999502	−14 27 13.7	− 9 18 58.0
Toronto . . .	+43 39 35.9	− 11 39.6	9.999301	+ 0 9 18.94	+ 5 17 34.65
Toulouse . . .	+43 36 45.3	− 11 39.5	9.999302	− 5 14 5.6	− 0 5 49.9
Trieste . . .	+45 38 45.4	− 11 40.3	9.999250	− 6 3 18.72	− 0 55 3.01
Troy (*N. Y.*) . .	+42 43 52.9	− 11 38.1	9.999325	− 0 13 33.42	+ 4 54 42.29
Tulse Hill . . .	+51 26 47.0	− 11 23.3	9.999102	− 5 7 48.0	+ 0 0 27.7
Turin	+45 4 8.0	− 11 40.4	9.999265	− 5 39 2.94	− 0 30 47.23
Tuscaloosa (*Ala. Univ.*)	+33 12 36.8	− 10 41.1	9.999561	− 0 41 56.03	+ 5 50 11.74
Twickenham . .	+51 27 4.2	− 11 23.3	9.999102	− 5 7 2.6	+ 0 1 13.1
Upsala (*New Obs.*) .	+59 51 29.4	− 10 9.3	9.998900	− 6 18 45.94	− 1 10 30.23
Utrecht . . .	+52 5 9.6	− 11 19.7	9.999086	− 5 28 46.7	− 0 20 31.0
Venice . . .	+45 26 10.5	− 11 40.4	9.999255	− 5 57 37.83	− 0 49 22.12
Vienna (*Josephstadt*) .	+48 12 53.8	− 11 36.2	9.999183	− 6 13 41.0	− 1 5 25.3
Vienna (*New Obs.*) .	+48 13 55.4	− 11 36.2	9.999183	− 6 13 37.20	− 1 5 21.49
Vienna (*Old Obs.*) .	+48 12 35.5	− 11 36.3	9.999184	− 6 13 47.41	− 1 5 31.70
Vienna (*Ottakring*) .	+48 12 46.7	− 11 36.2	9.999183	− 6 13 26.82	− 1 5 11.11
Warsaw . . .	+52 13 5.7	− 11 18.9	9.999082	− 6 32 23.1	− 1 24 7.4
Washington . .	+38 55 14.7	− 11 24.2	9.999422	0 0 0.00	+ 5 8 15.71
Washington (*Old Obs.*)	+38 53 38.8	− 11 24.1	9.999422	− 0 0 3.67	+ 5 8 12.04
Washington (*Smithsonian*)	+38 53 17.3	− 11 24.1	9.999422	− 0 0 9.5	+ 5 8 6.2
Washington (*Cath. Univ.*)	+38 56 14.8	− 11 24.2	9.999422	− 0 0 15.71	+ 5 8 0.00
Wellington . . .	−41 18 0.6	+ 11 34.3	9.999361	−16 47 22.23	−11 39 6.52
West Point (*Old Obs.*)	+41 23 31	− 11 34.6	9.999359	− 0 12 26.38	+ 4 55 49.33
West Point (*New Obs.*)	+41 23 22.1	− 11 34.6	9.999359	− 0 12 25.16	+ 4 55 50.55
Wilhelmshaven . .	+53 31 52.2	− 11 10.3	9.999050	− 5 40 50.92	− 0 32 35.21
Williamstown (*Mass.*).	+42 42 30	− 11 38.0	9.999325	− 0 15 26	+ 4 52 50
Williamstown (*Victoria*)	−37 52 7.2	+ 11 18.3	9.999448	−14 47 54.5	− 9 39 38.8
Wilna	+54 40 59.1	− 11 1.6	9.999021	− 6 49 24.58	− 1 41 8.87
Windsor . . .	−33 36 30.8	+ 10 44.9	9.999551	−15 11 36.22	−10 3 20.51
Zürich . . .	+47 22 40.0	− 11 38.2	9.999205	− 5 42 28.07	− 0 34 12.36

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

PART I—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

The greater portion of this Ephemeris, embracing the positions of the sun and moon; the distances of the moon from the centres of the sun and of the four most conspicuous planets, and from certain fixed stars; the ephemerides of the planets Mercury, Venus, Mars, Jupiter, and Saturn, is designed for the special use of navigators. The remainder contains the ephemerides of Uranus and Neptune, the heliocentric co-ordinates of the seven major planets, the rectangular equatorial co-ordinates of the sun, the moon's longitude and latitude, data for the libration of the moon, the obliquity of the ecliptic, the equation of the equinoxes, etc.

TIME.

Astronomers make use of two different kinds of time; mean solar time, which is to be distinguished from true, or apparent solar time; and sidereal time.

Solar Time.—Solar time is that used for all the purposes of ordinary life, and is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour-angle of the sun is called *Solar Time.* This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the same meridian are not exactly equal, owing to the varying motion of the earth around the sun, and to the obliquity of the ecliptic. The intervals between the sun's transits over the meridian being unequal it is impossible to regulate a clock or chronometer so that it shall accurately follow the sun.

To avoid the irregularity which would arise from using the true sun as the measure of time, a fictitious sun, called the *Mean Sun,* is supposed to move in the equator with a uniform velocity. This mean sun is supposed to keep, on the average, as near the real sun as is consistent with perfect uniformity of motion; it is sometimes in advance of it, and sometimes behind it, the greatest deviation being about 16 minutes of time.

Mean Solar Time, which is perfectly equable in its increase, is measured by the motion of this mean sun. The clocks in ordinary use and the chronometers used by navigators are regulated to mean solar time.

True, or *Apparent Solar Time* is measured by the motion of the real sun.

The difference between apparent and mean time is called the *Equation of Time.* By means of it, we change apparent to mean time, or the reverse. Thus, if the apparent time be given, the mean time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I of the Calendar for each month. If the mean time be given, the apparent time is obtained by applying the equation of time as directed by the precept on page II of the Calendar.

Sidereal Time.—Sidereal time is measured by the daily motion of the stars; or, as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascension of the stars is counted. This point is the vernal equinox, and its hour-angle is called *Sidereal Time.* Astronomical clocks, regulated to sidereal time, are called sidereal clocks.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over the meridian, and its next succeeding return to the same meridian. It is about 3^m 56^s shorter than the mean solar day; 365¼ solar days, or a year, being divided into 366¼ sidereal days. It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian. About March 21st of each year the sidereal clock agrees with the mean time, or ordinary clock, and the former gains on the latter about 3^m 56^s per day, so that at the end of a year it will have gained an entire day, and will again agree with the mean time clock.

Day.—The *Civil Day*, according to the customs of society, commences at midnight, and comprises twenty-four hours, from one midnight to the next following. The hours are counted from 0 to 12 from midnight to noon, after which they are again reckoned from 0 to 12 from noon to midnight. Thus the day is divided into two periods of 12 hours each, of which the first is marked A. M., and the last is marked P. M.

The *Astronomical Day* begins at noon on the civil day of the same date. It also comprises twenty-four hours, but they are reckoned from 0 to 24, and from the noon of one day to that of the next following. The astronomical as well as the civil time may be either apparent or mean, according as it is reckoned from apparent noon or from mean noon.

The civil day begins twelve hours before the astronomical day; therefore the first period of the civil day answers to the last part of the preceding astronomical day, and the last period of the civil day corresponds to the first part of the same astronomical day. Thus, January 9th, 2 o'clock, A. M., civil time, is January 8th, 14^h, astronomical time; and January 9th, 2 o'clock, P. M., civil time, is also January 9th, 2^h, astronomical time. The rule, then, for the transformation of civil time into astronomical time is this: *If the civil time is marked A. M., take one from the day and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.*

To change astronomical to civil time, we simply write P. M. after it, if it is less than 12 hours. If greater than 12 hours, we subtract 12 hours from it, add 1 to the days, and write A. M. For example, January 3d, 23 hours, astronomical time, is January 4th, 11 o'clock, A. M., civil time.

If the longitude from Greenwich be expressed in time, and, when *west, added* to the local time, or, when *east, subtracted* from the local time, the result is the corresponding Greenwich time. If the local mean time is used, the result is the Greenwich mean time, which ordinarily is that required for the use of this Ephemeris. The rule is the same, whether we use mean or sidereal time.

THE CALENDAR.

The Calendar is divided into twelve months, and to each month are assigned eighteen pages, the contents of which are as follow:—

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension* and *Declination*, and the *Equation of Time.* Adjoining columns contain the differences of these quantities for one hour. By multiplying this difference by the hours and parts of an hour from Greenwich apparent noon, and adding the amount to, or subtracting it from, the quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of any quantity for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, and, when greater accuracy is required, should be first interpolated for half the hours and parts of an hour of the Greenwich apparent time.

This page is chiefly used when the sun is observed on the meridian, and the local apparent time is $0^h\,0^m\,0^s$. The longitude from Greenwich expressed in time, if west, is at that instant the Greenwich apparent time, or time after Greenwich apparent noon; if east, it is time before Greenwich apparent noon. The longitude of any place is therefore employed in reducing the quantities on this page to apparent noon at the place.

The right ascension of the sun thus reduced is the sidereal time of local apparent noon. The difference between it and the clock time of the meridian passage of the sun is the error of the clock on sidereal time.

The declination of the sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the sun.

As an example of the use of page I:—

Let the sun's declination be required at apparent noon, 1900, May 3, at a place whose longitude is $179°\,40'$, or $11^h\,58^m\,40^s$ east from Greenwich:

		h	m	s
Local apparent time	May 3,	0	0	0
Longitude from Greenwich (subtractive) . . .		11	58	40
Greenwich apparent time	May 2,	12	1	20

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $12^h.022$ after Greenwich apparent noon on May 2, or $11^h.978$ before Greenwich apparent noon on May 3.

On page 74 of the Ephemeris we find that the change of declination in one hour is

	″
May 2, at Greenwich apparent noon . . .	+ 44.86
May 3, at Greenwich apparent noon . . .	+ 44.22
Difference for one day	0.64

If we want to be very exact, we find the amount of this hourly difference for the time which is half way between Greenwich noon and the time of observation; that is, for 6 hours after Greenwich noon of the 2nd, this being half of 12 hours. Six hours is 0.25 of a day; so the calculation is as follows:—

	″
Difference for one hour, May 2	44.86
Change for 0.25 of a day or $0''.64 \times 0.25$ . . .	− 0.16
Difference at 6 hours after noon	44.70

$$44''.70 \times 12.022 = 537''.4 = 8'\,57''.4$$

		°	′	″
Declination at Greenwich noon, May 2 . . .	N.	15	19	27.2
Change in 12.022 hours (additive)			8	57.4
Sun's declination at time of observation . . .	N.	15	28	24.6

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given, the time is $11^h.978$ before Greenwich noon of May 3; half this interval is about 0.25 of a day, and the hourly motion for the middle of the interval is $44''.38$. Then, we find:—

		°	′	″
Declination at Greenwich noon, May 3 . . .	N.	15	37	16.3
Product of $44''.38 \times 11.978 = 531''.6$ (subtractive) . .			8	51.6
Sun's declination at time of observation . . .	N.	15	28	24.7

It will always be well to make the calculation by both methods, as their agreement will show both to be right.

At sea it is ordinarily sufficient to have the declination to the nearest half minute, and the reduction may be found by Table 12 of BOWDITCH'S *American Practical Navigator*.

The equation of time, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the apparent time, or the time given by an observation of the sun, to obtain the mean time. The heading of the column directs the manner in which the equation is to be applied. When there is a change in the course of the month from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change takes place. The equation of time, as given on page I, is the mean time of apparent noon, or the hour-angle of the mean sun at that instant.

The Sun's Semidiameter and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The sun's semidiameter is used in reducing the altitude of the upper or lower limb of the sun to the altitude of the center; and in reducing the angular distance of the limb from the moon or some other object, to the distance from the center of the sun. The sidereal time of semidiameter passing the meridian is employed in obtaining the passage of the sun's center over the wires of a transit-instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension* and *Declination*, the *Equation of Time*, and the *Sidereal Time of Mean Noon*. The hourly changes of these quantities are also given, and may be used in reducing them to any Greenwich mean time. The hourly changes may be first interpolated for half the Greenwich time, when great precision is required, in the way described in explaining the calculation of the declination.

The right ascension and declination on pages I and II are affected by aberration, and therefore denote the *apparent* position of the *true* sun. Page II is more conveniently used when the mean time is known. This is the case in most observations of the sun out of the meridian, when the times have been noted by a clock or chronometer regulated to mean time. The quantities on this page can be reduced to mean noon of any place by interpolating for the longitude, as in the example of the sun's declination on the preceding page.

The sun's declination is required in finding the latitude of the place, the local time, and the sun's azimuth and amplitude, from observations of the sun.

The equation of time is needed in finding the mean time from observations of the sun, and the latitude from observations out of the meridian. The heading of the column directs the manner in which it is to be applied to mean time to obtain the apparent time.

The equation of time, as given on page II, is the apparent time of mean noon; and is equivalent to the hour-angle of the true sun at the instant of mean noon.

The sidereal time of mean noon is also the right ascension of the mean sun at Greenwich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, $9^s.8565$; or by Table III, appended to this volume, for reducing intervals of mean solar to sidereal time. Table 9 of Bowditch's *Navigator* may be used for the same purpose.

The sun's right ascension and the sidereal time of mean noon, or right ascension of the mean sun, are useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the R. A. of the mean sun for this time, as last explained; this being added to the local mean time will give the sidereal time.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time, gives the interval of sidereal time from noon. Subtracting from this the corresponding reduction of a sidereal interval to a mean time interval, in Table II, appended to this volume, or Table 8 of Bowditch's *Navigator*, will give the mean time required.

This reduction may also be found by multiplying $9^s.8296$ by the hours and parts of an hour of the given sidereal time.

As examples of the use of page II:—

1.—Let the sun's right ascension and the equation of time be required for 1900, May 22, $9^h\ 2^m\ 30^s$, A. M., mean time, at a place whose longitude is 100° 10′, or $6^h\ 40^m\ 40^s$, west of Greenwich.

		h	m	s
Local astronomical mean time	May 21,	21	2	30
Longitude from Greenwich (additive)		6	40	40
Greenwich mean time	May 22,	3	43	10 = $3^h.7194$

Sun's Right Ascension.	h	m	s	*Equation of Time.*	m	s
May 22, Greenwich noon	3	55	3.57	May 22, noon	3	34.08 (additive)
H. D. $10^s.032 \times 3.7194$	+	0	37.31	H. D. $-0^s.175 \times 3.72$	−	0.65
	3	55	40.88		3	33.43

In this case, the hourly differences interpolated to half the interval, or $1^h.9$ after noon, have been used.

The equation of time in this example is additive to mean time. Its reduction could also have been found by Table 12 of Bowditch's *Navigator*.

2.—If the sidereal time is required for the same date and time, we have:—

	h	m	s
May 22, Sidereal Time (at Greenwich mean noon)	3	58	37.65
Hourly difference $9^s.8565 \times 3.7194$	+		36.66
Add the local astronomical mean time	21	2	30.00
The required sidereal time is (rejecting 24^h)	1	1	44.31

The reduction $0^m\ 36^s.66$ could have been found in Table III corresponding to the Greenwich mean time $3^h\ 43^m\ 10^s$ or by Table 9 of Bowditch's *Navigator*.

3.—On 1900, May 22, A. M., at a place whose longitude is 100° 10′ W., suppose the sidereal time to be $1^h\ 1^m\ 44^s.31$, and that the corresponding mean time is required.

The astronomical day is May 21; the longitude in time, $+\ 6^h\ 40^m\ 40^s$, or $+\ 6^h.678$.

		h	m	s
May 21, Sidereal Time (at Greenwich mean noon)		3	54	41.09
The H. D. $9^s.8565 \times 6.678$, or the reduction for $6^h\ 40^m\ 40^s$ in Table III		+	1	5.82
The sidereal time of local mean noon		3	55	46.91
The given sidereal time ($+\ 24^h$, if necessary for the following subtraction)		25	1	44.31
Subtracting the first from the second gives the sidereal interval from noon		21	5	57.40 = $21^h.0993$
$-\ 9^s.8296 \times 21.0993$ or the reduction for $21^h\ 5^m\ 57^s.4$ in Table II		−	3	27.40
The required astronomical mean time is	May 21,	21	2	30.00

Page III contains, for Greenwich mean noon of each day, *The Sun's True Longitude* and *Latitude*, and the *Logarithm of the Radius Vector of the Earth.* The longitudes of the sun are the true geometric longitudes, not corrected for aberration. The longitude is given in two columns, headed λ and λ'; λ representing the sun's longitude counted from the true equinox of the date; and λ', the same co-ordinate counted from the mean equinox of the beginning of the year, (January $0^d.0$). A column of hourly differences enables the computer to obtain the sun's longitude for any hour from noon. The hourly differences of the logarithm of the radius vector are likewise given. The latitude is referred to the ecliptic of the date.

The last column on page III contains the *Mean Time of Sidereal Noon;* that is, the number of hours, minutes and seconds after Greenwich mean noon when the first point of Aries passes the meridian of Greenwich. It may be reduced to any meridian by interpolating for the longitude, or to any Greenwich sidereal time by means of the hourly difference, $-9^s.8296$. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time; or from Table 8 of Bowditch's *Navigator*.

This column may be used in converting sidereal time to mean time instead of that on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is less than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for May 20, that is the preceding astronomical day.

	h	m	s	
May 21, the mean time of Greenwich sidereal noon is . . .	20	2	1.45	
The H. D. — $9^s.8296 \times 6.678$, or the reduction for longitude, Table II	—	1	5.64	
The mean time of local sidereal noon	20	0	55.81	
Add the given sidereal time	1	1	44.31	$= 1^h.0290$
The sum is	21	2	40.12	
— $9^s.8296 \times 1.0290$, or the reduction for $1^h\ 1^m\ 44^s.31$ in Table II .	—	0	10.11	
The required astronomical mean time . . May 21,	21	2	30.01	

Page IV contains *The Moon's Semidiameter* and Equatorial *Horizontal Parallax*, for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of this quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the sun's declination and the equation of time in the preceding examples. The sign plus or minus prefixed to the hourly differences, shows whether the horizontal parallax is increasing or decreasing.

The reduction of the moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.272, or by simply computing the proportional part.

If, for example, the semidiameter of the moon is to be taken out for 1900, January 26, 10^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of January 26 is $7''.9$; then,

$$12^h : 10^h = 7''.9 : 6''.6,$$

which is the correction to be added to the semidiameter at noon, because the semidiameter is increasing. The moon's semidiameter then, for January 26, 10^h, is $15'\ 48''.4$.

The moon's semidiameter and horizontal parallax are required for all observations of the moon. When great precision is needed, the hourly differences should be first interpolated for half the interval of Greenwich time from noon or midnight, and a correction applied to the horizontal parallax for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich,* which is given on page IV to tenths of a minute, is also accompanied with a column of differences for one hour of longitude, by means of which, having the longitude converted into time, the local time of the moon's meridian passage at any other place may be computed. The reduction may be taken by simple inspection from BOWDITCH's Table 11. The last column of this page contains the *Age* of the moon, or the time elapsed since the preceding new moon, to tenths of a day.

Pages V—XII contain *The Moon's Right Ascension* and *Declination,* for each day and hour of Greenwich mean time. They are accompanied with columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may be taken from a well-regulated chronometer, or obtained by applying the longitude converted into time, to the local mean time of the observer. The right ascension or declination is taken out for the day and hour of the Greenwich mean time; the *Diff. for 1 Minute* multiplied by the minutes and parts of a minute of the Greenwich time, and the product added to, or subtracted from the quantity, according as the quantity is increasing or decreasing.

Thus, suppose the moon's right ascension and declination are required for 1900, August 3, $10^h\ 10^m\ 30^s$, astronomical mean time at Greenwich:—

Right Ascension.	h	m	s	*Declination.*		°	′	″
August 3, 10^h . . .	14	41	24.70	. . . . . .	S.	17	58	53.9
Diff. $2^s.0850 \times 10.5$ . .	= +		21.89	$-6''.896 \times 10.5$	= −		1	12.4
August 3, $10^h\ 10^m\ 30^s$ . .	14	41	46.59	. . . . . .	S.	18	0	6.3

The differences interpolated for $5^m.2 = 0^h.09$ are, for the right ascension $2^s.0850$, and for the declination $-6''.896$, which have been used for greater precision.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the earth.

Pages XIII—XVIII contain the *Lunar Distances*, or the angular distances of the centre of the moon from the centre of the sun, and from the four larger planets and certain fixed stars, as they would appear to an observer at the centre of the earth. They are given for every third hour of Greenwich mean time, beginning at noon; the dates are therefore astronomical. All the distances that can be observed on the same day, are grouped together under that date; and the columns are read from left to right, across both pages of the same opening. The letter W. or E. is affixed to the name of the sun, planet or star, to indicate that it is on the west, or east side of the moon.

An observer on the earth's surface having measured a lunar distance, corrected it for errors of his instrument and for the semidiameter of the objects, and cleared it from the effects of refraction and parallax, finds the true or geocentric distance, that is, the distance as it would have appeared from the centre of the earth at the moment of observation. With this distance and the distances in the Ephemeris of the same bodies on the same day, the Greenwich mean time of the observation can be found.

To lessen the labor of computation, there is given in the Ephemeris, between every two successive distances, the logarithm of the seconds of time in which the distance changes 1″; or, as it is usually called, the *Proportional Logarithm of the Difference.* It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time we have the following rule:—

Find in the Almanac the two distances between which the true distance falls; take out the nearer of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.

Find the difference between the true distance and the distance taken from the Almanac; and from the proportional logarithm of this difference, as found in the Navigator (Table 45), subtract the P. L. of Diff. taken from the Almanac.

The result is the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Almanac, when the earlier Almanac-distance is used; to be subtracted from the hours of Greenwich time, when the later Almanac-distance is used.

Another method is, to add the common logarithm of the difference of the true and the Almanac-distances to the P. L. of Diff. of the Almanac; the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. Table 34 of BOWDITCH'S *Navigator* saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the Ephemeris varies, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which follows it in the Ephemeris, (or, more strictly, half the difference of the preceding and following ones). With this difference, and the first correction of the Greenwich time already found, enter Table I, appended to this volume, and take out the corresponding seconds, which are to be added to the approximate Greenwich time when the Prop. Logs. in the Ephemeris are decreasing; and subtracted when they are increasing.

Thus the Greenwich mean time of the observation can be obtained. If the observer has noted the time of observation by a chronometer, the difference of this chronometer-time and the Greenwich mean time will be the error of the chronometer on Greenwich time as found from the lunar distance. In this way lunar distances can be used as a check upon the chronometer. By a series of carefully observed lunar distances on both sides of the moon, the chronometer-error may generally be ascertained within 20 or 30 seconds.

If the observer has found the local mean time of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the lunar distance will be his longitude. A longitude derived by this method should always be considered as uncertain by 5′ or more.

As an example of finding the Greenwich mean time from a lunar distance, suppose that in 1900, January 15, the corrected distance of the moon's centre from that of Spica is 83° 52′:—

	° ′ ″		
Corrected distance	83 52 0		
Distance in Ephemeris Jan. 15, XII^h.	84 38 27	P. L.	0.2950
Difference	0 46 27	P. L.	0.5883
	h m s	P. L.	0.2933
Time from XII^h (*after*)	+ 1 31 37		
Corr. for 2d Diff., Table I	— 2		
Greenwich mean time Jan. 15	13 31 35		

By a table of common logarithms, or a table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:—

From Ephemeris	P. L.	0.2950
Diff. of distances, 46′ 27″ = 2787″	log	3.4451
Red. of Greenwich time, 5497^s = 1^h 31^m 37^s	log	3.7401

The result is the same as by the previous method.

Pages 218—249 contain the geocentric ephemerides of the seven major planets. The positions are referred to the equator and true equinox of the date, and corrected for aberration; they are, therefore, apparent positions. All the data except meridian passage are given for the moment of Greenwich mean noon. The column *Meridian Passage* gives the hour, minute and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it has been observed for time, latitude or azimuth. The mode of reducing them to any instant of Greenwich mean time is the same as in the examples for the sun, previously given. The local mean time of passage across any other meridian can be found by dividing the daily differences by 24, and multiplying the quotient by the hours and fractions of the longitude of the place. The product is subtractive from the time of Greenwich passage when the place is east of Greenwich, and additive when west. The corrections can never exceed one-half the change for one day.

Pages 250—271 contain the heliocentric positions of the seven major planets, and the logarithms of their distances from the earth. The heliocentric longitude is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required. The daily motion is given for the moment of Greenwich mean noon. The column *Reduction to Orbit* gives the correction to be applied to the heliocentric longitudes in order to obtain the longitude counted along the orbit of the planet. This longitude is equal to the distance of the node from the mean equinox, plus the distance of the planet from the node. The heliocentric latitude is counted from the moving plane of the ecliptic. The *Logarithm of Radius Vector* is the logarithm of the distance of the centre of the planet from that of the sun, at each Greenwich mean noon given in the first column. The two last columns give, in the same way, the logarithm of the true distance of the centre of the planet from that of the earth. The one column gives the quantity for the Greenwich noon indicated on the left hand side of the page, and the other for the time which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean midnight of the same day; in the case of Venus and Mars, it is the mean noon of the day immediately following; in the case of Jupiter and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 272—279 contain the rectangular co-ordinates of the centre of the sun, referred to the centre of the earth as the origin, and to the true equator and equinox of each date as the circle and point of reference. Each co-ordinate is given first for Greenwich mean noon, and in the column following for mean midnight of the same day. The columns

Reduc. to Mean Eq'x of Jan. o give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of January o.

Pages 280—283 give the longitude and latitude of the moon for every Greenwich mean noon and midnight. Both quantities are referred to the true ecliptic and equinox of the date.

Page 284 contains the position of the moon's equator, the moon's mean longitude, and the mean longitude of the moon's ascending node.

Page 285 contains the elements of the libration of the moon, and the sun's aberration and horizontal parallax. The epochs of greatest libration of the moon, together with the formulæ for finding the libration in longitude and latitude are given on page 437. *The Sun's Aberration* is the quantity which is to be applied to the true longitude of the sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The *Sun's Equatorial Horizontal Parallax,* given in the next column, is the angle subtended by the radius of the earth's equator, as seen from the centre of the sun.

Page 286 contains, for each fifth Greenwich mean noon, the values of the principal elements arising from the motion of the equinox. The column *Precession in Longitude from 1900.0* gives the precession from the beginning of the Besselian fictitious year to the date. The *Nutation in Longitude* is the correction to be applied to the longitude of the body referred to the mean equinox, in order to obtain that longitude as referred to the true equinox. When the correction is positive, the true longitudes are greater than those referred to the mean equinox; while the contrary is true when the correction has the negative sign. The *Nutation in R. A.* is equal to that in longitude, multiplied by the cosine of the obliquity of the ecliptic. The *Nutation in Obliquity* is the correction to be applied to the mean obliquity of the date, in order to obtain the true or apparent obliquity. The correction is positive or negative, according as the true obliquity is greater or less than the mean obliquity.

The column *Obliquity* gives the true inclination of the earth's equator to the ecliptic, without correction for the terms depending on the moon's longitude.

Pages 287—288 contain the short period terms of the nutation in longitude and obliquity; they are not included in the values of nutation given on page 286.

PART II—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 289 contains the formulæ for reducing the positions of the fixed stars, using the notation of BESSEL, and the constants stated in the Appendix. The formulæ by which the star-numbers are computed are also given.

Pages 290—293 contain the logarithms of the *Besselian Star Numbers, A, B, C, D,* for each Washington mean midnight. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given. If used in accordance with the English and French notation, the pair of quantities *A* and *B* must be interchanged with the pair *C* and *D;* that is, *A* must be interchanged with *C,* and *B* with *D.* In the first column along with the solar day is given, for certain dates, the sidereal hour of Washington mean midnight. The sidereal time for which any set of quantities is given can be found by interpolation from these numbers.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:—

Computation of the apparent place of π Aquarii for 1900, August 17, for the upper transit at Washington.

	log a	0.4862	log b	6.9627	log c	8.7814	log d	8.4492 n
(Page 292)	log A	9.9845	log B	0.5316	log C	1.1860	log D	1.0719 n
	log a'	1.2594	log b'	9.6253	log c'	9.6436	log d'	8.1387
	log $A\ a$	0.4707	log $B\ b$	7.4943	log $C\ c$	9.9674	log $D\ d$	9.5211
	log $A\ a'$	1.2439	log $B\ b'$	0.1569	log $C\ c'$	0.8296	log $D\ d'$	9.2106 n

		h m s		° ′ ″
Mean Place, 1900.0,	$a_0 =$	22 20 10.204	$\delta_0 =$	0 52 11.48
	$A\,a =$	+ 2.956	$A\,a' =$	+ 17.54
	$B\,b =$	+ 0.003	$B\,b' =$	+ 1.43
	$C\,c =$	+ 0.928	$C\,c' =$	+ 6.76
	$D\,d =$	+ 0.332	$D\,d' =$	− 0.16
	$E =$	+ 0.003	$\tau\,\mu' =$	0.00
	$\tau\,\mu =$	0.000		
Apparent Place, August 17,	$a =$	22 20 14.426	$\delta =$	0 52 37.05

Pages 294—301 contain the *Independent Star-Numbers*, which can be used for the same purpose. The column τ gives the fraction of the year from the beginning of the fictitious year to each date. These quantities are connected with those of BESSEL by the relations given on page 289, where are also found the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, $a, b, c, d, a', b', c', d'$. The independent star-numbers are given in order that the apparent place of the star may be determined when it is not convenient to compute these numbers.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:—

Computation of the apparent place of π Aquarii for 1900, August 17, for the upper transit at Washington.

$a_0 =$	335° 3′		$\delta_0 = +$	0° 52′	
$G =$	9 58		$G + a_0 =$	345 1	
$H =$	127 33		$H + a_0 =$	102 36	h m s
log $\frac{1}{15}$	8.8239	log $\frac{1}{15}$	8.8239	$a_0 =$	22 20 10.204
log g	1.2931	log h	1.2869	$f + f' =$	+ 2.968
log sin $(G + a_0)$	9.4125 n	log sin $(H + a_0)$	9.9894	$(g) =$	− 0.005
log tan δ_0	8.1798	log sec δ_0	0.0000	$(h) =$	+ 1.260
log (g)	7.7093 n	log (h)	0.1002	$\tau\,\mu =$	0.000
		Apparent R. A.,		$a =$	22 20 14.427
log g	1.2931	log h	1.2869	$\delta_0 =$	0° 52′ 11″.48
log cos $(G + a_0)$	9.9850	log cos $(H + a_0)$	9.3387 n	$(g') =$	+ 18.97
log (g')	1.2781	log sin δ_0	8.1797	$(h') =$	− 0.06
		log (h')	8.8053 n	$(i) =$	+ 6.66
				$\tau\,\mu' =$	0.00
		Apparent Dec.		$\delta =$	0 52 37.05
log i	0.8233				
log cos δ_0	0.0000				
log (i)	0.8233				

Pages 302—309 contain the mean places of three hundred and eighty-three stars, for the beginning of the fictitious year 1900, or the moment when the sun's mean longitude is 280°. The annual variations are to be considered as the differential coefficients of each co-ordinate with respect to the time at the beginning of the year.

Pages 310—321 contain the apparent positions of the four north polar stars, a, δ and λ Ursæ Minoris, and 51 Cephei, for every upper transit at Washington. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26th is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 310, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But, the lower transit following that of July 1st (page 316), does not take place until July 2.3. Hence, the lower transit of July 1st precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column of *Mean Solar Date.*

Pages 322—397 contain, for every tenth upper transit at Washington, the apparent places of the 379 other stars given in the list of mean places. The mean solar date in each left hand column gives the day and tenth of the transit; so that each intermediate transit may be readily identified. Along with each co-ordinate is given the change for ten days. This quantity is to be regarded as the differential coefficient corresponding to the dates for which the star-places are given.

Pages 398—405 contain the apparent right ascension, declination, and semidiameter of the sun, and the sidereal time, all for Washington mean noon. Adjoining columns give the seconds of right ascension and of declination for apparent noon, that is, for the moment of transit of the sun's centre over the meridian of Washington. The hours and minutes of right ascension, and the degrees and minutes of declination are the same for both mean and apparent noon. In case they would have differed, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that there is always a correspondence between the two numbers. The hourly motions in right ascension and declination are given for the moment of mean noon, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the sun's centre over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich.*

Pages 406—413 contain the right ascension, declination, semidiameter, and parallax of the moon, at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the moon's centre over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington exceed those given in the column *Mean Time of Transit,* supposing the rate of change to be uniform and equal to what it is at the moment of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the moon in right ascension were uniform. By means of them, the position of the moon can be computed with astronomical accuracy at the moment of transit over any meridian not exceeding one hour in longitude from that of Washington, by taking account of second differences. With greater longitudes of the place, the accuracy of the result obtained in this way will diminish. The columns of sidereal time of semidiameter passing meridian, etc., do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When two opposite limbs are both so nearly full that they can be well observed, both are indicated.

Pages 414—430 contain the geocentric apparent right ascensions and declinations of the seven major planets, and their semidiameters and horizontal parallaxes, for the moments of all those transits over the meridian of Washington which can be observed.

PART III—PHENOMENA.

This part gives the principal astronomical phenomena of the year, reduced to Washington mean time, except in the case of the eclipses and the data for the rings of Saturn, which are given in Greenwich mean time.

Pages 431—436 inclusive contain the elements necessary for computing the eclipses of the sun which occur during the year.

The eclipse-elements are given for the moment of conjunction of the sun and moon in right ascension. The subsequent tables and results are not, however, computed from these elements unchanged; but from the accurate positions of the two bodies as interpolated for each hour of the eclipse. The principal circumstances of each eclipse are as follows:—

On the line "Eclipse begins" is given the Greenwich mean time at which the earth first touches the moon's penumbra, and the longitude and latitude of the point of touching.

The "Central eclipse begins" when the axis of the moon's shadow first touches the earth, and the longitude and latitude of the point of touching follow.

"Central eclipse at noon" indicates the moment when the axis of the shadow is coincident with the plane of the meridian at the point of its intersection with the earth's surface. To the observer at this point the eclipse will be central at the moment of apparent noon.

"Central eclipse ends" and "Eclipse ends" have the converse meaning of the beginning.

Maps of the Eclipses.—The regions in which each eclipse is visible, are shown upon the maps given in connection with them. From these maps may also be derived the approximate determination of the times of beginning and ending, and of the magnitude of the eclipses at any place. The dotted curves show the outlines of the shadow for each hour of Greenwich mean time and therefore pass through all the places where the eclipse begins or ends at that hour. To find at what hour the eclipse begins at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between these two hours of Greenwich mean time: the fraction of the hour may be determined by dividing the hour proportionally to the space which it represents on the map. This division may be a little more exact by allowing for the changes in this space as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the time at which the eclipse of 1900, May 28, begins and ends at Washington, D. C.

For the beginning we compare the distance of the place from the curves of 1^h and 2^h and we find it to correspond to about 15 minutes from the former, therefore the time of beginning is approximately $0^h\ 45^m$; for the end we compare the distance of the place from the curves of 3^h and 4^h and find it to be about 18 minutes from the former, therefore the approximate time of end is $3^h\ 18^m$, both of which are probably correct to within 2 or 3 minutes. Changing to local mean time the result will be:—

		Beginning.			*Ending.*		
		d	h	m	d	h	m
Greenwich mean time	May	28	0	45	28	3	18
Longitude west			5	8		5	8
Local mean time	May	27	19	37	27	22	10

In the case of total and annular eclipses, a rough estimate of the magnitude of the eclipse may be obtained from the position of the place relatively to the central line and to the limit. On the central line, the eclipse is annular or total, while on the limit, the limb of the moon only grazes that of the sun.

More Accurate Computations.—A more accurate determination of the phases as visible at any point of the earth's surface may be obtained from the Besselian elements which are given for every ten minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the centre of the earth, perpendicular to the right line joining the centres of the sun and moon. This latter line is the axis of the moon's shadow, and the plane is called the *fundamental plane*. We take the intersection of this plane with that of the earth's equator as the axis of X, and the centre of the earth as the origin of co-ordinates. The axis of Y is perpendicular to that of X, and directed toward the north; x and y are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; this direction being that from the earth toward the moon and sun The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l and l' are the radii of the shadow-cones upon the fundamental plane, l corresponding to the penumbra, and l' to the umbra, or annulus. The notation is that of CHAUVENET'S *Spherical and Practical Astronomy*, in which l' is regarded as positive for an annular, and negative for a total eclipse.

The angles f and f', the tangents of which are given, are the angles which the elements of the respective shadow-cones make with the axis of the shadow; or, they are the semi-angles of the two cones.

At the bottom of the table are given the logarithms of the change of x, y and μ, in one minute, in order to facilitate the interpolation to any required moment.

The method of computing the eclipse from the given elements is as follows: It is premised that the moments of beginning and ending are those at which the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find such distance and radius we compute—

(1) The co-ordinates, ξ, η and ζ, of the observer, at some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase, together with their variations for one minute.

(2) The co-ordinates x and y of the axis of the shadow at the same moment, which, with their variations for one minute, are taken from the tables of elements.

(3) Hence, the position and motion of the observer relative to the axis of the shadow.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follow:—

(1) Find the geocentric co-ordinates of the station referred to the earth's equator, which are represented by $\rho \cos \varphi'$ and $\rho \sin \varphi'$, ρ being the distance from the centre of the earth, and φ' the geocentric latitude. These may be obtained from geodetic tables, or may be computed from the following table by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Co-ordinates of a Place.

φ	Log *F*.		Log *G*.	
0°	0.00000		0.00295	
5	0.00001	1	0.00294	1
10	0.00004	3	0.00291	3
15	0.00010	6	0.00285	6
20	0.00017	7	0.00278	7
25	0.00026	9	0.00269	9
30	0.00037	11	0.00258	11
35	0.00048	11	0.00247	11
40	0.00061	13	0.00234	13
45	0.00074	13	0.00221	13
50	0.00086	12	0.00209	12
55	0.00099	13	0.00196	13
60	0.00111	12	0.00184	12
65	0.00121	10	0.00174	10
70	0.00130	9	0.00165	9
75	0.00138	8	0.00157	8
80	0.00143	5	0.00152	5
85	0.00146	3	0.00149	3
90	0.00147	1	0.00147	2

For the assumed Greenwich mean time of computation, take from the table of elements the values of sin d, cos d, and μ. Put:

λ, the longitude west from Greenwich. The co-ordinates of the observer will then be:—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$
$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda)$$
$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda)$$

and their variations in one minute of mean time will be:—

$$\xi' = [7.63992]\, \rho \cos \varphi' \cos (\mu - \lambda)$$
$$\eta' = [7.63992]\, \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992]\, \xi \sin d$$

ζ' is not needed.

(2) The co-ordinates x and y of the axis of the shadow are taken from the tables of elements for the same assumed moment of Greenwich mean time, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. The variations for one minute are represented by x' and y'. Their logarithms are given at the foot of the tables.

(3) The distance m and position-angle M of the axis of the shadow relative to the observer, and the relative motions, n and N, are computed by the formulæ:—

$$m \sin M = x - \xi$$
$$m \cos M = y - \eta$$
$$n \sin N = x' - \xi'$$
$$n \cos N = y' - \eta'$$

(4) The radius L of the shadow or penumbra at the distance ζ from the fundamental plane is computed by the formula

$$L = l - \zeta \tan f$$

l and f being found in the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or end of the eclipse, we shall have—

$$m = L$$

But, as this condition can scarcely ever be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values to this angle, of which one will be in the first and the other in the second quadrant when sin ψ is positive, and one in the third and the other in the fourth when sin ψ is negative. But, simplicity will be gained by taking only that value of ψ for which cos ψ is positive. This value lies between the limits + 90° and − 90°. The correction τ to the assumed time will be found in minutes, from—

For beginning: $$\tau = -\frac{m \cos (M - N)}{n} - \frac{L \cos \psi}{n}$$

For ending: $$\tau = -\frac{m \cos (M - N)}{n} + \frac{L \cos \psi}{n}$$

One such pair of values of τ cannot, however, give the times of both beginning and ending with accuracy. To attain accuracy we must, in commencing the computation, assume two times, one near that of beginning, and another near that of ending. These approximate times may be derived from the chart of the eclipse. The computation for the first assumed time will give a small value of τ which, applied to the assumed time, will give a nearly correct time for the beginning of the eclipse, and a large value which, added to the assumed time, will give an inaccurate time of ending. The computation for the second assumed time will give a small and nearly correct value of τ, to be applied to the assumed time for the end, and a large negative and inaccurate one to be subtracted for the beginning. We shall thus deduce two times of each phase, only one of which is to be considered approximately correct.

The more accurate times of beginning and ending may now be taken in place of the first assumed ones, and the computation may be repeated from the beginning, leading to a pair of values of τ, which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors. The following theorem will, however, enable us to obtain a second approximation to the true times of each phase without repeating the computation.

THEOREM.—*The error of each result is approximately proportional to the square of the correction* τ, *multiplied by the sine of the sun's hour-angle,* $(\mu-\lambda)$, *for the middle of the interval between the time of computation and that of the phase.*

To apply this theorem we find the two values of $\tau^2 \sin(\mu-\lambda)$ corresponding to the required phase. We then find the ratio of these quantities—which will commonly be a large number, and divide the difference of the results by this ratio. The quotient will be a correction to be applied to the more accurate result in such a way as to make it deviate yet more from the less accurate one. This correction should be positive in the local forenoon, and negative in the afternoon, and its value should never materially exceed $0^{m}.001\, \tau^2$.

Unless the times chosen for computation are unusually in error, say ten minutes or more, the corrected results thus obtained will be theoretically correct within less than a second. But to guard against numerical errors it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, further corrections and computations may be made by the computer according to his own judgment.

It may be remarked that the uncertainty of the ephemerides is such that a prediction may be several seconds in error from this unavoidable cause alone.

Position-angle of Point of Contact.—The position-angle P, of the point of contact, reckoned from the north point of the sun's limb toward the east, is found by the formula

For beginning: $P = N - \psi \pm 180°$
For end: $P = N + \psi$

it being assumed that, in each case, the value of ψ is taken between the limits ± 90°.

Computation of the Solat Eclipse of 1900, May 28, for Norfolk, whose position is—

	°	′	″
Latitude, $\varphi = +$	36	49	33
Longitude, $\lambda = +$	76	17	46

Constants for the given place:—

$$\rho \sin \varphi' = 9.77529$$
$$\rho \cos \varphi' = 9.90387$$

From the Eclipse Charts and the table on page 416 we find the approximate times of the phases to be—

		d	h	m	
Beginning	May	28	0	40	Greenwich Mean Time.
Total phase		28	1	55	
Ending		28	3	15	

Greenwich Mean Time,	May	Beginning. $28^{d}\ 0^{h}\ 40^{m}$	Total Phase. $1^{h}\ 55^{m}$	Ending. $3^{h}\ 15^{m}$
		° ′ ″	° ′ ″	° ′ ″
	μ	10 44 36	29 29 42	49 29 42
	λ	76 17 46	76 17 46	76 17 46
	$\mu-\lambda$	294 26 50	313 11 56	333 11 56

		Beginning.	Total Phase.	Ending.
Greenwich Mean Time,	May	$28^d\ 0^h\ 40^m$	$1^h\ 55^m$	$3^h\ 15^m$
	$\rho \cos \varphi'$	9.90387	9.90387	9.90387
	$\sin (\mu-\lambda)$	9.95921 *n*	9.86272 *n*	9.65408 *n*
	$\log \xi$	9.86308 *n*	9.76659 *n*	9.55795 *n*
	ξ	− 0.72960	− 0.58424	− 0.36137
	$\rho \sin \varphi'$	9.77529	9.77529	9.77529
	$\cos d$	9.96886	9.96884	9.96881
		9.74415	9.74413	9.74410
	(1)	+ 0.55481	+ 0.55479	+ 0.55475
	$\rho \cos \varphi'$	9.90387	9.90387	9.90387
	$\sin d$	9.56289	9.56305	9.56322
	$\cos (\mu - \lambda)$	9.61684	9.83539	9.95065
		9.08360	9.30231	9.41774
	(2)	+ 0.12123	+ 0.20059	+ 0.26166
(1)—(2)	η	+ 0.43358	+ 0.35420	+ 0.29309
	$\rho \sin \varphi' \sin d$	9.33818	9.33834	9.33851
	(3)	+ 0.21786	+ 0.21794	+ 0.21802
	$\rho \cos \varphi' \cos d \cos (\mu - \lambda)$	9.48957	9.70810	9.82333
	(4)	+ 0.30872	+ 0.51062	+ 0.66579
(3)+(4)	ζ	+ 0.52658	+ 0.72856	+ 0.88381
	const. log	7.63992	7.63992	7.63992
	$\rho \cos \varphi' \cos (\mu - \lambda)$	9.52071	9.73926	9.85452
	$\log \xi'$	7.16063	7.37918	7.49444
	ξ'	+ 0.001448	+ 0.002394	+ 0.003122
	const. log	7.63992	7.63992	7.63992
	$\xi \sin d$	9.42597 *n*	9.32964 *n*	9.12117 *n*
	$\log \eta'$	7.06589 *n*	6.96956 *n*	6.76109 *n*
	η'	− 0.001164	− 0.000932	− 0.000577
	$x - \xi$	− 0.53316	+ 0.01252	+ 0.52681
	$y - \eta$	− 0.12929	− 0.00013	+ 0.11350
	$x' - \xi'$	+ 0.007765	+ 0.006821	+ 0.006093
	$y' - \eta'$	+ 0.001831	+ 0.001592	+ 0.001230
	$m \sin M$	9.72686 *n*	8.09760	9.72166
	$m \cos M$	9.11157 *n*	6.11394 *n*	9.05500
	$\tan M$	0.61529	1.98366 *n*	0.66666
	M	256° 22′ 9″	90° 35′ 42″	77° 50′ 30″
	$\sin M$	9.98759 *n*	9.99998	9.99014
	$\log m$	9.73927	8.09762	9.73152
	$n \sin N$	7.89014	7.83385	7.78483
	$n \cos N$	7.26269	7.20194	7.08991
	$\tan N$	0.62745	0.63191	0.69492
	N	76° 43′ 55″	76° 51′ 45″	78° 35′ 13″
	$\sin N$	9.98825	9.98848	9.99133
	$\log n$	7.90189	7.84537	7.79350

		Beginning.	Total Phase.	Ending.
Greenwich Mean Time,	May	$28^d\ 0^h\ 40^m$	$1^h\ 55^m$	$3^h\ 15^m$
	$\tan f$	7.66390	7.66174	7.66390
	$\log \zeta$	9.72146	9.86247	9.94636
		7.38536	7.52421	7.61026
	$\zeta \tan f$	+ 0.00243	+ 0.00334	+ 0.00408
	l	+ 0.54319	− 0.00252	+ 0.54355
	L	+ 0.54076	− 0.00586	+ 0.53947
	$M-N$	179° 38′ 14″	13° 43′ 57″	359° 15′ 17″
	$\sin (M-N)$	7.80152	9.37546	8.11418 *n*
	$\log m$	9.73927	8.09762	9.73152
	$\operatorname{colog} L$	0.26699	2.23210 *n*	0.26803
	$\sin \psi$	7.80778	9.70518 *n*	8.11373 *n*
	ψ	+ 0° 22′ 5″	− 30° 28′ 40″	− 0° 44′ 40″
	$\log \frac{m}{n}$	1.83738	0.25225	1.93802
	$\cos (M-N)$	9.99999 *n*	9.98740	9.99996
		1.83737 *n*	0.23965	1.93798
	$-\frac{m}{n} \cos (M-N)$	+ 68.765	− 1.736	− 86.692
	$\log L$	9.73301	7.76790 *n*	9.73197
	$\cos \psi$	9.99999	9.93542	9.99996
	$\operatorname{colog} n$	2.09811	2.15463	2.20650
		1.83111	9.85795 *n*	1.93843
	$\frac{L \cos \psi}{n}$	∓ 67.781	∓ 0.721	± 86.782
			m	m
	τ	+ 0.984	− 2.457 − 1.015	+ 0.090
		h m	h m	h m
	T	0 40	1 55	3 15
	t	0 40.984	1 52.543 1 53.985	3 15.090
	λ	+ 5 5.184	+ 5 5.184	+ 5 5.184
		d h m	d h m	d h m
Local Mean Time,	May	27 19 35.800	27 20 47.359 27 20 48.801	27 22 9.906
Duration of totality,			m 1.44	

No correction is necessary since the assumed times differ very little from the computed ones.

Therefore we have

		d	h	m	s	
Beginning of the eclipse,	May	27	19	35	48.0	Local Mean Time.
Beginning of total eclipse,	"	27	20	47	21.5	
End of total eclipse,	"	27	20	48	48.1	
End of the eclipse,	"	27	22	9	54.4	

Angle of position:

	Beginning.	Ending.
	° ′	° ′
N	76 43.9	78 35.4
ψ (+ 180°)	179 37.9	− 0 44.7
P	256 21.8	77 50.7

from the north point of the sun's disk towards the east for direct image.

The Mean Places of Stars Occulted During the Year.—Pages 438—441 contain the mean places for 1900.0 of stars (other than those given on pages 302—309) occulted by the moon in 1900, with their annual proper motions.

Elements of Occultations.—Pages 442—471 give the elements for the prediction of the times of occultation of stars and planets by the moon. In the columns referring to the star, those headed *Red'ns from* 1900.0 give the quantities necessary to reduce the mean place of the star at the beginning of 1900 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

The quantities in the following five columns are all given for the moment of geocentric conjunction of the star and moon in right ascension. Let there be a line passing from the star through the centre of the moon, and let a plane perpendicular to this line pass through the centre of the earth: this plane will be the fundamental plane for the occultation. The system of co-ordinates is similar to that already described for eclipses. The cone circumscribing the moon and star may be regarded as a cylinder having everywhere the same diameter as the moon. This cylinder will intercept the fundamental plane in a circle of which the linear diameter will be the same as that of the moon.

The *Washington Mean Time* is the moment at which the two bodies are in geocentric conjunction in right ascension. At this moment the co-ordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour-Angle H* gives the common geocentric hour-angle of the moon and star at the same moment, counted from the meridian of Washington—positive toward the west and negative toward the east. Column Y gives the co-ordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the hourly variation of x and y. The linear unit in these columns is the earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star behind the limb of the moon may be computed for any part of the earth by a method nearly the same as that already explained for computing eclipses, only more simple.

We shall first show how to compute an isolated occultation for a particular place, assuming it to be visible at that place, and then show how all the occultations which will be visible at a place may be selected and computed by a more rapid process.

(1) The geocentric co-ordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed by the formulæ and table given in connection with eclipses on page 527.

As in the case of eclipses, it is necessary to have an approximate time of the phenomenon, corresponding to that obtained from the charts of the eclipses. The quantity H being the Washington west hour-angle of the two bodies at the moment of geocentric conjunction, $H - \lambda$ will be the local hour-angle of the star at this same moment. Let us call this angle h_0, putting

$$h_0 = H - \lambda$$

where λ is the longitude west of *Washington.*

The next step will then be to find the approximate moment of apparent conjunction in right ascension as seen from the place. An approximate correction to reduce the time and hour-angle for geocentric conjunction to those for apparent conjunction may be taken from Mr. Downes's table, printed in the volumes of the Ephemeris for 1882—1899. This correction will have the same sign as h_0.

When this table is not available, the correction may be computed thus: Compute the quantities ξ_0, ξ' and τ from the formulæ,

$$\xi_0 = \rho \cos \varphi' \sin h_0$$

$$\xi' = [9.4192] \cos (h_0 + \tfrac{1}{3} h_0)$$

$$\tau = \frac{\xi_0}{x' - \xi'}$$

τ will then be the approximate interval between the times of geocentric and local conjunction. By applying it to the Washington mean time of the former, as given with the elements, we shall have the Washington mean time of the latter within a few minutes.

The average duration of an occultation is about an hour. Thence, by adding $0^h.5$ to and subtracting it from the mean time of apparent conjunction, we shall have approximate times of the phases of immersion and emersion for farther computation. Let us then put,

$$\tau_1 = \tau - 0^h.5$$
$$\tau_2 = \tau + 0^h.5$$

T, the Washington mean time of geocentric conjunction in R. A.

d, the declination of the star.

(2) Compute for the moments $T + \tau_1$ and $T + \tau_2$ the following quantities, in which we write τ for each of the quantities τ_1 and τ_2. The latter, when used as angles, are to be changed to arc by multiplying by 15, and the minutes are to be further increased by one-sixth the number of degrees in order to reduce to the sidereal hour-angle.

$$\begin{aligned}
\xi &= \rho \cos \varphi' \sin (h_0 + \tau) \\
\eta &= \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (h_0 + \tau) \\
\xi' &= [9.4192]\, \rho \cos \varphi' \cos (h_0 + \tau) \\
\eta' &= [9.4192]\, \rho \cos \varphi' \sin d \sin (h_0 + \tau) = [9.4192]\, \xi \sin d \\
x &= x' \tau \\
y &= Y + y' \tau
\end{aligned}$$

Compute m, M, n and N from the equations

$$\begin{aligned}
m \sin M &= x - \xi \\
m \cos M &= y - \eta \\
n \sin N &= x' - \xi' \\
n \cos N &= y' - \eta' \\
n' &= \frac{n}{60} = [8.2218]\, n \\
\sin \psi &= [0.5650]\, m \sin (M - N)
\end{aligned}$$

Then, t_1 and t_2 from the equations

$$t_1 = -\frac{m}{n'} \cos (M - N) - \frac{[9.4350]}{n'} \cos \psi \quad \text{(Beginning.)}$$

$$t_2 = -\frac{m}{n'} \cos (M - N) + \frac{[9.4350]}{n'} \cos \psi \quad \text{(End.)}$$

The quantities t_1 and t_2 will then be the corrections in minutes to be applied to the respective times $T + \tau_1$ and $T + \tau_2$ to obtain the Washington mean times of the phases.

As in the case of eclipses, the small value of t_1 will give an accurate result for one phase, and the large value an inaccurate result for the other. Both accurate results may then be corrected by comparison with the inaccurate one, in the way described for eclipses, and a result obtained which will probably be correct within a fraction of a minute of time.

As a check upon the result, it will be advisable to compute ξ, η, x and y for the moments finally obtained. If the times are correct these quantities will fulfil the condition,

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2723$$

If $\log m \sin (M - N) = 9.4350$ nearly, a recalculation will generally be necessary to determine whether, numerically, $\sin \psi < 1$, or $\sin \psi > 1$. In the latter case, the impossible value of $\sin \psi$ indicates that an occultation at the given place is impossible, unless the computed distance from the moon's limb is within the errors of the ephemerides of the moon and star.

In such cases of near approach to the moon's limb, we may take $\psi = 90°$, or $270°$, according as $\sin (M - N)$ is positive or negative; and for finding the time of nearest approach,

$$t = -\frac{m \cos (M - N)}{n'}$$

Putting π for the moon's horizontal parallax, the distance from the moon's limb will be,

$$\pi\ [m \sin (M - N) - 0.2723]$$

disregarding the sign of $\sin (M - N)$; or, allowing for the augmentation of the semidiameter,

$$\pi\ [m \sin (M - N) - 0.2723]\ [1 + z \sin \pi]$$

where

$$z = \rho \cos \varphi' \cos d \cos (h_0 + \tau) + \rho \sin \varphi' \sin d$$

The position-angle P, of the line from the moon's centre to the star at the times of contact, reckoned from the north point toward the east, is given by the formulæ:—

$$P = N - \psi \qquad \text{for immersion,}$$
$$P = N + \psi \pm 180^\circ \quad \text{for emersion,}$$

it being supposed that the value of ψ, in each case, is taken between the limits ± 90°.

To find the angle from the vertex, we compute the angle C from the formula,

$$\tan C = \frac{\xi + t\,\xi'}{\eta + t\,\eta'}$$

in which the value of t corresponding to the phase is to be used. Then

$$V = P - C$$

is the angle from the vertex, also reckoned from the north toward the east.

As an example of an isolated occultation, we will compute that of 53 Tauri, on August 17, 1900, for Albany, whose position is

$$\varphi = +\ 42^\circ\ 39'\ 49''.5$$
$$\lambda = -\quad 0^h\ 13^m\ 12^s.9$$

Constants for the given place,

$$\rho \sin \varphi' = 9.8288$$
$$\rho \cos \varphi' = 9.8672$$

From the elements on page 461, we have

$$H = -\ 3^h\ 48^m.3$$
$$h_0 = H - \lambda = -\ 3\ 35.1$$

From DOWNES's Table, or from the formulæ on page 532, we find the correction to the Washington mean time of geocentric conjunction to be about $-\ 1^h\ 13^m$, therefore the Washington mean time of apparent conjunction at the given place is August $17^d\ 13^h\ 27.3^m$; subtracting and adding 30^m, we shall have the approximate Washington mean times of immersion and emersion to be used in the computation, thus:

$\tau_1 = -\ 1^h\ 43^m$ $\qquad T + \tau_1 =$ August $17^d\ 12^h\ 57^m.3$

$\tau_2 = -\ 0\ 43$ $\qquad T + \tau_2 =$ " $17\ 13\ 57.3$

			Immersion.		Emersion.
			d h m		h m
Washington Mean Time,	August		17 12 57.3		13 57.3
	h_0	—	3 35.1	—	3 35.1
	τ (in sidereal time)	—	1 43.3	—	0 43.1
	$h_0 + \tau$ (in arc)	—	79° 36′	—	64° 33′
	$\rho \cos \varphi'$		9.8672		9.8672
	$\sin (h_0 + \tau)$		9.9928 n		9.9557 n
	$\log \xi$		9.8600 n		9.8229 n
	ξ	—	0.7244	—	0.6651

		Immersion.	Emersion.
Washington Mean Time,	August	$17^d\ 12^h\ 57^m.3$	$13^h\ 57^m.3$
	$\rho \sin \varphi'$	9.8288	9.8288
	$\cos d$	9.9704	9.9704
		9.7992	9.7992
	(1)	+ 0.6298	+ 0.6298
	$\rho \cos \varphi'$	9.8672	9.8672
	$\sin d$	9.5524	9.5524
	$\cos (h_0 + \tau)$	9.2565	9.6332
		8.6761	9.0528
	(2)	+ 0.0474	+ 0.1129
(1)—(2)	η	+ 0.5824	+ 0.5169
	const. log	9.4192	9.4192
	$\rho \cos \varphi' \cos (h_0 + \tau)$	9.1237	9.5004
	$\log \xi'$	8.5429	8.9196
	ξ'	+ 0.0349	+ 0.0831
	const. log	9.4192	9.4192
	$\xi \sin d$	9.4124 *n*	9.3753 *n*
	$\log \eta'$	8.8316 *n*	8.7945 *n*
	η'	— 0.0679	— 0.0623
	$\log x'$	9.7628	9.7628
	$\log \tau$	0.2346 *n*	9.8553 *n*
	$\log x$	9.9974 *n*	9.6181 *n*
	x	— 0.9940	— 0.4151
	$\log y'$	8.7235	8.7235
log y' + log τ	$\log y' \tau$	8.9581 *n*	8.5788 *n*
	$y' \tau$	— 0.0908	— 0.0379
	Y	+ 0.5371	+ 0.5371
Y — [illegible]	y	+ 0.4463	+ 0.4992
	$x - \xi$	— 0.2696	+ 0.2500
	$y - \eta$	— 0.1361	— 0.0177
	$x' - \xi'$	+ 0.5442	+ 0.4960
	$y' - \eta'$	+ 0.1208	+ 0.1152
	$m \sin M$	9.4308 *n*	9.3979
	$m \cos M$	9.1338 *n*	8.2480 *n*
	$\tan M$	0.2970	1.1499 *n*
	M	243° 13′	94° 3′
	$\sin M$	9.9507 *n*	9.9989
	$\log m$	9.4801	9.3990
	$n \sin N$	9.7358	9.6955
	$n \cos N$	9.0821	9.0615
	$\tan N$	0.6537	0.6340
	N	77° 29′	76° 55′
	$\sin N$	9.9896	9.9886
	$\log n$	9.7462	9.7069
	colog 60	8.2218	8.2218
	$\log n'$	7.9680	7.9287

			Immersion.	Emersion.
Washington Mean Time,	August		$17^d\ 12^h\ 57^m.3$	$13^h\ 57^m.3$
	const. log		0.5650	0.5650
	$\log m$		9.4801	9.3990
	$\sin (M - N)$		9.3917	9.4692
	$\sin \psi$		9.4368	9.4332
	ψ		15° 52′	15° 44′
	$\log \frac{m}{n'}$		1.5121	1.4703
	$\cos (M - N)$		9.9864 *n*	9.9803
			1.4985 *n*	1.4506
	$-\frac{m}{n'} \cos (M - N)$		+ 31.52 m	− 28.22 m
	const. log		9.4350	9.4350
	colog n'		2.0320	2.0713
	$\cos \psi$		9.9831	9.9834
			1.4501	1.4897
	$\frac{[9.4350] \cos \psi}{n'}$		− 28.19 m	+ 30.88 m
	t		+ 3.3	+ 2.7
			d h m	h m
	T	August	17 12 57.3	13 57.3
Washington Mean Time of Phase,		"	17 13 0.6	14 0.0
	λ		— 0 13.2	— 0 13.2
Albany Mean Time,		"	17 13 13.8	14 13.2
Angle of position:			° ′	° ′
	N		77 29	76 55
	$\psi\ (+ 180°)$		15 52	195 44
	P		61 37	272 39

from the north point of the moon's limb toward the east for direct image.

Prediction of Many Occultations for a Given Place.—When it is desired to predict all the occultations which will be visible at some one place, tables may be constructed and applied in such a way as to greatly diminish the labor of computation. In using such tables, the most convenient course will be to find for each occultation the hour-angle of the star at the moment of apparent conjunction in right ascension, as seen from the place of observation. The table of elements, pages 442—471, gives H, the Washington hour-angle at the moment of geocentric conjunction. The corresponding geocentric hour-angle at the place will be

$$h_0 = H - \lambda \quad (\lambda = \text{west longitude from Washington}).$$

The moment of apparent conjunction, as seen from the station, will be given by the condition $\xi = x$; or, using the values of ξ and x,

$$\rho \cos \varphi' \sin h - x' \tau$$

h being the west hour-angle of the star at the moment in question, and τ the interval, in hours of mean time, which has elapsed since geocentric conjunction. We shall therefore have,

$$h = h_0 + \tau$$

for the hour-angle at the end of the interval τ after geocentric conjunction. In strictness, τ should here be multiplied by the factor $1 + \frac{1}{365.25}$, because the star moves a little more than 15° in an hour of mean time; but the error arising from the neglect of the factor is too small to be important, as it will affect the predicted time of conjunction by less than 10 seconds. The equation for finding τ is therefore,

$$\rho \cos \varphi' \sin (h_0 + \tau) = x' \tau$$

The quantities h_0 and x' being derived immediately from the data of the Ephemeris, the quantity τ is readily obtained by successive approximation, and may be tabulated as a function of h_0 and x'. The computation of τ is effected as follows. We have

$$\sin (h_0 + \tau) = \sin h_0 + 2 \sin \tfrac{1}{2} \tau \cos (h_0 + \tfrac{1}{2} \tau) \qquad (1)$$

The value of τ in arc being seldom more than 24° we may put τ itself for $2 \sin \frac{1}{2} \tau$. The equation will then become

$$\rho \cos \varphi' \sin h_0 + \tau \rho \cos \varphi' \cos (h_0 + \tfrac{1}{2} \tau) = x' \tau$$

from which we find

$$\tau = \frac{\rho \cos \varphi' \sin h_0}{x' - \rho \cos \varphi' \cos (h_0 + \frac{1}{2} \tau)} \qquad (2)$$

To tabulate τ, we must first have a table of the quantities

$$\begin{aligned} \xi &= \rho \cos \varphi' \sin h \\ \xi' &= [9.41916]\, \rho \cos \varphi' \cos h \end{aligned} \qquad (3)$$

which table may be formed for every 10 minutes (in time) of h. If we then put ξ_0 for the value of ξ corresponding to $h = h_0$ and ξ'_1 for the value of ξ' corresponding to $h = h_0 + \frac{1}{2} \tau$, we shall have

$$\tau = \frac{\xi_0}{x' - \xi'_1} \qquad (4)$$

Since we must know the value of τ, approximately, before we can take ξ'_1 from the table, this equation can be solved only by successive approximations. The approximations converge so rapidly as to offer no difficulty. It will be best to begin by comparing values of τ for the two extremes of x', namely, $x' = 0.48$ and $x' = 0.60$, because the approximate values of τ can then be interpolated for all the intermediate values of x'. For the first approximation may be taken—

$$\begin{aligned} \tfrac{1}{2} \tau &= 50^m \sin \tfrac{4}{3} h_0 \quad (\text{for } x' = 0.48) \\ \tfrac{1}{2} \tau &= 40^m \sin \tfrac{4}{3} h_0 \quad (\text{for } x' = 0.60) \end{aligned} \qquad (5)$$

or, the approximate values of τ may be taken from Mr. DOWNES's table. It will be best to make the computation for every 30^m of h_0, and to find the intermediate values of τ for every 10^m by interpolation. Then for each 30^m of h_0 we take ξ' from a table with the argument $h_0 + \frac{1}{2} \tau$, and log ξ with the argument h_0, and thence compute τ by (4). If the value of τ thus arrived at differs more than 3^m from that employed in taking out ξ', a new value may be used to correct ξ', and the computation may be repeated. The values corresponding to $x' = 0.51$, $x' = 0.54$, and $x' = 0.57$, can then be computed with the single interpolation of approximate values of τ, and afterward the table can be extended by interpolation to every 0.01 of x' between $x' = 0.48$ and $x' = 0.60$. It will be best to compute τ in the first place to every 0.001 of an hour, and to drop the last figure in forming the definitive table. The table thus formed will be called *Table I.*

The values of η and η' may then be tabulated for every degree of the star's declination, and every 10^m of h. It is a mere question of convenience whether to compute the table for negative values of d, since by putting

$$\eta_1 = \rho \sin \varphi' \cos d$$
$$\eta_2 = -\rho \cos \varphi' \sin d \cos h$$

η_1 may be given in a table of single-entry; and taking η_2 from the table of double-entry for a positive d, we shall have

$$\eta = \eta_1 \pm \eta_2$$

the lower sign being used for a negative d. But the extension of the table for η to negative values of d is so readily made that it will probably be found better to do it, so as to save taking out η_1 and η_2 separately.

This table for η will be called *Table II*, and the corresponding one for η' with the same arguments *Table III*. The precepts for using the tables will then be as follow:—

From Table I with the arguments x' and $H - \lambda = h_0$ take out the value of τ. It will be sufficient to use the nearest 0.01 of x'. τ will be of the same sign as h_0. Then, enter Table II with the arguments d (the star's declination) and $h = h_0 + \tau$, and take out the value of η. Form the quantities $y = Y + y'\tau$, and $y - \eta$. If the latter quantity lies between the limits $\pm$ 0.28, it is almost certain that there will be an occultation. If it falls without the limits $\pm$ 0.33, it is almost certain that there will not be an occultation. A convenient rule to adopt will be—

$$y' < 0.10, \text{ limits } = \pm 0.29$$
$$0.10 < y' < 0.15, \text{ limits } = \pm 0.30$$
$$0.15 < y' < 0.20, \text{ limits } = \pm 0.31$$
$$0.20 < y' \quad \text{ limits } = \pm 0.33$$

Here, only the absolute value of y' is to be considered, without respect to its algebraic sign.

If $y - \eta$ falls between the limits thus indicated, take the values of ξ' and η' from the appropriate tables and compute v, Q and $\triangle$ from the equations

$$v \sin Q = y' - \eta'$$
$$v \cos Q = x' - \xi'$$
$$\triangle = (y - \eta) \cos Q$$

If $\triangle > 0.2723$ or $\log \triangle > 9.4350$ there will be no occultation, though the moon may graze the star when $\triangle - 0.2723$ is very small. If $\triangle < 0.2723$, compute

$$\tau_1 = -\frac{y - \eta}{v} \sin Q \qquad \cos P = \frac{\triangle}{0.2723} \quad (P < 180°)$$

$$\tau_2 = \frac{0.2723 \sin P}{v}$$

We shall then have—

Local mean time of immersion, $T - \lambda + \tau + \tau_1 - \tau_2$
Local mean time of emersion, $T - \lambda + \tau + \tau_1 + \tau_2$

Position-angle from north toward east at immersion, $180° - Q - P$
Position-angle from north toward east at emersion, $180° - Q + P$

In predicting the occultations for a given place, the first operation will be to go over the list of occultations in the Ephemeris, and select those which may be visible. The conditions of possible visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H - \lambda$, taken without regard to sign, must be less than the semi-diurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east horizon, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The sun must not be much more than an hour above the horizon at the local mean time $T - \lambda$, unless the star is bright enough to be seen in the day time.

The most convenient course will be to write the value of $-\lambda$ on the bottom of a sheet of paper, and passing through the list of occultations, pause over each one for which condition (1) is fulfilled, and examine whether conditions (2) and (3) are fulfilled. If either fails, the computer passes on. Very often it will require some examination to find whether $H - \lambda$ or $T - \lambda$ falls within the limits; in these cases, the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

Phenomena of Planets and Satellites, pages 474—507.—These are, for the most part, sufficiently explained in the body of the work. The following additional explanations are added for completeness :—

Disks of Mercury and Venus, pages 474—475.—The angle θ, needed in reducing meridian observations, is the angle which the arc of the great circle from the planet to the sun, makes with the arc from the planet toward the west, reckoned in the direction west, north, east, south. This position-angle is reckoned from 0° to 360°, as in the measurement of double stars, the planet taking the place of the central star. But its measure is 90° greater than that of a double star.

We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Satellites and Disk of Mars, page 476.—This page gives the Washington mean time of the greatest eastern and western elongations, the position angles and the distance of the satellites from the centre of the planet, for elongations visible at Washington and the apparent disk of the planet for every thirtieth day throughout the year.

Satellites of Jupiter, pages 477—501.—The times of phenomena are explained at the foot of each page ; the diagram is on page 477.

Phenomena, pages 508—509.—The conjunctions, quadratures, and oppositions of the planets with respect to the sun, give the hours when the longitude of each planet differs from that of the sun by 0°, 90°, or 180°.

The conjunctions of the moon and planets with each other are given in right ascension. The degrees and minutes to the right show the difference of declination at the moment of conjunction.

Latitude by Observed Altitude of Polaris.—Table IV replaces the Tables A, B, C, D, given as a *Supplement* to the volumes of the Ephemeris for 1874—1881, and is intended for use at sea and reconnaissance on land. It will furnish an approximate value of the latitude, the probable error of which, in so far as the table is concerned, will be a few tenths of a minute of arc.

The directions for using the table are adapted to a right ascension of Polaris equal to $1^h\ 23^m.0$. Somewhat greater accuracy may be insured by substituting the right ascension of Polaris at the date of observation, from pages 310—321 of this volume.

APPENDIX.

ON THE CONSTRUCTION OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1900.

In the volume of the Ephemeris for 1900 the adopted constants of precession, nutation and aberration, and the mean obliquity of the ecliptic, are as follows:

Precession,	$50''.2482 + 0''.00022\,t$,	NEWCOMB, *Astronomical Constants.*
Nutation,	$9''.21$,	*Paris Conference, 1896.*
Aberration,	$20''.47$,	*Paris Conference, 1896*
Obliquity,	$20^\circ\,27'\,8''.26 - 0''.468\,t$,	NEWCOMB, *Astronomical Constants.*

where t is the number of years after 1900.

The nutation given on page 286 is derived from NEWCOMB'S *Tables of the Sun,* tables XXXII and XXXIII, and does not include the terms of short period. This value of the nutation has been used in all the ephemerides of the sun, moon and planets, and in the apparent places of the stars, which are given every tenth day.

The terms of short period in the nutation given on pages 287—288 are derived from tables XXXIV, XXXV, XXXVI, and XXXVII of NEWCOMB'S *Tables of the Sun.* These terms are included in the values of $\delta\psi$ and $\delta\epsilon$ used in the computation of the star numbers (p. 289); they are also included in the computation of the daily ephemeris of the four circumpolar stars, but the quantity $f' = -0''.1866 \sin 2\,☾ + 0''.0622 \sin (☾ - \Gamma)$, which is the same for all the stars, is omitted.

The mean places of the 383 stars, given on pages 302—309, are from a new catalogue of standard stars prepared under the direction of Professor NEWCOMB and not yet published.

The apparent places of the stars, pages 310—397, have been derived from new tables prepared under the same general plan as those given in the *Star Tables of the American Ephemeris,* Washington, 1869. The apparent places of Sirius and Procyon have been corrected for the effect of orbital motion, as determined from AUWERS'S investigations; the value of these corrections are—

Year.	Sirius.		Procyon.	
	s	″	s	″
1900.0	$\Delta\alpha = -0.077$	$\Delta\delta = +1.22$	$\Delta\alpha = +0.054$	$\Delta\delta = -0.68$
1901.0	$\Delta\alpha = -0.097$	$\Delta\delta = +1.13$	$\Delta\alpha = +0.046$	$\Delta\delta = -0.80$

The ephemeris of the sun is constructed from NEWCOMB'S *Tables of the Sun,* Part I, Vol. VI, *Astronomical Papers of the Ameriean Ephemeris.*

The adopted value of the mean equatorial horizontal parallax of the sun is 8″.80. *Paris Conference, 1896.*

The adopted semidiameter of the sun at the earth's mean distance is that of AUWER'S, 16′ 59″.63; for the apparent semidiameter this value is increased by 1″.15 for irradiation, but the constant 1″.15 is omitted in the computation of eclipses.

The sun's rectangular equatorial co-ordinates have been computed from the longitudes and latitudes by the following formulæ:—

$$\begin{aligned} X &= R \cos \lambda, \\ Y &= R \sin \lambda \cos \epsilon - 19.3\, R\, \beta, \\ Z &= R \sin \lambda \sin \epsilon + 44.5\, R\, \beta. \end{aligned}$$

The reductions to mean equinox, 1900.0, are computed by the formulæ,

$$\begin{aligned} \Delta X &= + Y \sec \epsilon\, \Delta \lambda \sin 1'', \\ \Delta Y &= - X \cos \epsilon\, \Delta \lambda \sin 1'' + Z\, \Delta \epsilon \sin 1'' - 9.1\, \tau R \sin (\lambda + 186^\circ), \\ \Delta Z &= - X \sin \epsilon\, \Delta \lambda \sin 1'' - Y \Delta \epsilon \sin 1'' + 21.0\, \tau R \sin (\lambda + 186^\circ). \end{aligned}$$

Where R is the sun's radius vector;
λ, the sun's true longitude;
β, the sun's true latitude, expressed in seconds of arc;
ϵ, the obliquity of the ecliptic;
$\Delta \lambda$, the reduction of longitude for precession and nutation from January 0;
$\Delta \epsilon$, the reduction of the mean to the apparent obliquity;
τ, the fraction of the year since January 0.

The numerical coefficients are in units of the seventh place of decimals.

The latitude, longitude and parallax of the moon are derived from HANSEN'S *Tables de la Lune*, London, 1857, the mean longitude being corrected in accordance with NEWCOMB'S *Researches on the Motion of the Moon*, Part I, page 268,* and a corrected table substituted for Table XXXIV.

The semidiameter of the moon is computed from the moon's horizontal parallax by the formula,

$$S = 0.272274\, \pi + 2''.5$$

The constant 2″.5 is omitted in the computation of eclipses and occultations, as due entirely to telescopic and ocular irradiation.

The ephemerides of Mercury and Venus are derived from NEWCOMB'S *Tables*, Parts 2 and 3, Vol. VI, *Astronomical Papers of the American Ephemeris.*

The ephemeris of Mars was computed from manuscript tables based on the corrected elements derived in the Supplement to the American Ephemeris for 1897, *The elements of the four inner planets and the fundamental constants of Astronomy, by* S. NEWCOMB.

The ephemerides of Jupiter and Saturn are derived from the tables constructed by Mr. GEORGE W. HILL, Parts 1 and 2, Vol. VII, *Astronomical Papers of the American Ephemeris.*

The ephemerides of Uranus and Neptune are derived from Professor NEWCOMB'S tables, published by the *Smithsonian Institution.*

The semidiameters of the planets are computed from the following values:—

	Semidiameter. ″	Log Dist. ″	Authority.
Mercury	3.34	0.00	LE VERRIER, *Theory of Mercury.*
Venus	8.546 ± 0.086	0.00	PEIRCE, from the Washington Observations of 1845 and 1846, made with the Mural Circle.
Mars	2.842 ± 0.057	0.25	
Jupiter (polar)	18.78 ± 0.067	0.70	
Saturn (polar)	8.77 ± 0.039	0.95	
Uranus	1.68 ± 0.3	1.30	
Neptune	1.28	1.48	
Jupiter (equatorial)	20.00	0.70	
Saturn (equatorial)	9.38	0.95	

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* *Astronomical Observations made at the U. S. Naval Observatory, Washington, 1875,* Appendix II.

The elements of eclipses of the sun and occultations of stars by the moon are given in accordance with Bessel's method, using the special forms in Chauvenet's *Spherical and Practical Astronomy.*

The eclipses of Jupiter's satellites are computed from Todd's *Continuation of* Damoiseau's *Tables,* Washington, 1876. The occultations, transits, etc., are computed from Woolhouse's Tables, *British Nautical Almanac* for 1835, Table II of each satellite having been adapted to Damoiseau's Tables.

The elongations and conjunctions of the satellites of Saturn are computed from manuscript tables prepared by Professor Newcomb.

The apparent elements of the rings of Saturn are computed from Bessel's data, except those for the dusky ring.

The elongations of the satellites of Uranus, and of the satellite of Neptune are computed from the data of Professor Newcomb's *Uranian and Neptunian Systems,* Washington, 1875.

In compiling the positions of observatories, the latest available data have been used. The positions have been furnished, in many instances, through the courtesy of the directors of the Observatories, in response to a circular issued by the Superintendent of the American Ephemeris.

The reduction to geocentric latitude, and the logarithm of the radius of the earth, are derived from Clarke's elements of the terrestrial spheroid, as adopted by the U. S. Coast and Geodetic Survey.

$$\log e = 8.9152503$$
$$\varphi' - \varphi = -11'\ 40''.43 \sin 2\varphi + 1''.19 \sin 4\varphi$$
$$\log \rho = 9.9992645 + 0.0007374 \cos 2\varphi - 0.0000019 \cos 4\varphi$$

Table IV, for finding the latitude from an observed altitude of Polaris, is constructed for—

(1) An altitude of Polaris equal to 45°.
(2) A declination of Polaris equal to + 88° 46'.4.

The principal computations of the Ephemeris have been distributed in the following manner:—

The ephemeris of the sun was computed by Mrs. E. B. Davis; the moon's longitude, latitude, semidiameter and horizontal parallax, by Professor Keith; the right ascension and declination in the office of the British Nautical Almanac, by an arrangement for exchange of work with that office; the culminations, by Professor W. W. Hendrickson; the lunar distances, by Mr. A. Doolittle; Mercury, Venus, Mars, Jupiter, Saturn, Uranus, and Neptune, by Mr. Roberdeau Buchanan; Jupiter's satellites, by Professor H. D. Todd; the satellites of Saturn, Uranus, and Neptune, by Mr. W. S. Harshman; the Besselian and independent star numbers, by Mr. W. Auhagen and Mr. H. L. Rice; the apparent places of the fixed stars were prepared by Mr. Hedrick, Miss E. A. Hedrick, and Mr. W. Auhagen; the occultations, by Mr. Auhagen; and the eclipses were computed and the charts projected by Professor Hendrickson.

CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

Approximate Interval.		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																									
		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3
0 20	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
0 30	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9
0 40	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11
0 50	2 10	1	1	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13
1 0	2 0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14
1 10	1 50	1	1	2	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15
1 20	1 40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16
1 30	1 30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16

		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																							
		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	7
0 20	2 40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12
0 30	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17
0 40	2 20	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	22
0 50	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	25
1 0	2 0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28
1 10	1 50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30
1 20	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31

		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																		
		102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138
h m	h m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0 10	2 50	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9	9
0 20	2 40	13	13	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17
0 30	2 30	18	18	18	19	19	19	20	20	20	21	21	21	22	22	22	23	23	24	24
0 40	2 20	22	22	23	23	24	24	25	25	25	26	26	27	27	28	28	28	29	29	30
0 50	2 10	26	26	26	27	27	28	29	29	29	30	30	31	31	32	32	33	33	34	34
1 0	2 0	28	29	29	30	30	31	31	32	33	33	34	34	35	35	36	37	37	38	38
1 10	1 50	30	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	40	40	41
1 20	1 40	31	32	33	33	34	34	35	35	36	37	38	38	39	39	40	41	41	42	42
1 30	1 30	32	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	42	42	43

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	$0^{\text{h.}}$	$1^{\text{h.}}$	$2^{\text{h.}}$	$3^{\text{h.}}$	$4^{\text{h.}}$	$5^{\text{h.}}$	$6^{\text{h.}}$	$7^{\text{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0	0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1	0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2	0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3	0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4	0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5	0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6	0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7	0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8	0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9	0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10	0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11	0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12	0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13	0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14	0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15	0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16	0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17	0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18	0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19	0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20	0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21	0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 43.922	0 52.752	1 2.582	1 12.411	22	0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23	0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24	0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25	0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26	0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27	0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28	0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29	0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30	0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31	0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32	0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33	0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34	0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35	0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36	0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37	0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38	0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39	0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40	0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41	0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42	0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43	0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44	0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45	0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46	0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47	0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48	0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49	0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50	0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51	0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52	0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53	0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54	0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55	0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56	0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57	0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58	0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59	0.161
Sidereal	$0^{\text{h.}}$	$1^{\text{h.}}$	$2^{\text{h.}}$	$3^{\text{h.}}$	$4^{\text{h.}}$	$5^{\text{h.}}$	$6^{\text{h.}}$	$7^{\text{h.}}$	For Seconds.	

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side-real.	$8^{h.}$	$9^{h.}$	$10^{h.}$	$11^{h.}$	$12^{h.}$	$13^{h.}$	$14^{h.}$	$15^{h.}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5	0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29 245	11	0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30 884	21	0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54	0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	0.161
Side-real.	$8^{h.}$	$9^{h.}$	$10^{h.}$	$11^{h.}$	$12^{h.}$	$13^{h.}$	$14^{h.}$	$15^{h.}$	For Seconds.	

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side-real.	$16^{\text{h.}}$	$17^{\text{h.}}$	18^{h}	$19^{\text{h.}}$	$20^{\text{h.}}$	$21^{\text{h.}}$	$22^{\text{h.}}$	$23^{\text{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.248	3 44.114	3 53.943	48	0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161
Side-real.	$16^{\text{h.}}$	$17^{\text{h.}}$	$18^{\text{h.}}$	$19^{\text{h.}}$	$20^{\text{h.}}$	$21^{\text{h.}}$	$22^{\text{h.}}$	$23^{\text{h.}}$	For Seconds.	

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	$0^{\text{h.}}$	$1^{\text{h.}}$	$2^{\text{h.}}$	$3^{\text{h.}}$	$4^{\text{h.}}$	$5^{\text{h.}}$	$6^{\text{h.}}$	$7^{\text{h.}}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0	0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1	0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2	0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3	0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4	0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5	0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6	0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7	0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8	0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9	0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10	0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11	0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12	0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13	0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14	0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15	0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16	0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17	0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18	0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19	0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20	0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21	0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22	0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23	0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24	0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25	0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26	0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27	0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28	0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29	0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30	0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31	0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32	0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33	0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34	0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35	0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36	0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37	0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38	0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39	0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40	0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41	0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42	0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43	0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44	0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45	0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46	0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47	0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48	0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49	0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50	0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51	0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52	0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53	0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54	0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55	0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56	0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57	0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58	0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59	0.162
Mean Solar.	$0^{\text{h.}}$	$1^{\text{h.}}$	$2^{\text{h.}}$	$3^{\text{h.}}$	$4^{\text{h.}}$	$5^{\text{h.}}$	$6^{\text{h.}}$	$7^{\text{h.}}$	For Seconds.	

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	$8^{h.}$	$9^{h.}$	$10^{h.}$	$11^{h.}$	$12^{h.}$	$13^{h.}$	$14^{h.}$	$15^{h.}$	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0	0.000
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	0.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	0.014
6	1 19.837	1 29.694	1 39.550	1 49 407	1 59.263	2 9.120	2 18.976	2 28.833	6	0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10	0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12	0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3 042	2 12.898	2 22.755	2 32.611	29	0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48	0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.134
50	1 27 066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26 861	2 36.718	54	0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7 806	2 17.662	2 27.519	2 37.375	58	0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162
Mean Solar.	$8^{h.}$	$9^{h.}$	$10^{h.}$	$11^{h.}$	$12^{h.}$	$13^{h.}$	$14^{h.}$	$15^{h.}$	For Seconds.	

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	16$^{h.}$	17$^{h.}$	18^{h}	19$^{h.}$	20$^{h.}$	21$^{h.}$	22$^{h.}$	23^{h}	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162
Mean Solar.	16$^{h.}$	17$^{h.}$	18$^{h.}$	19$^{h.}$	20$^{h.}$	21$^{h.}$	22$^{h.}$	23$^{h.}$	For Seconds.	

TABLE FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to the local sidereal time.

If the sidereal time is { less than 1h 23m.0, subtract it from 1h 23m.0; between 1h 23m.0 and 13h 23m.0, subtract 1h 23m.0 from it; greater than 13h 23m.0, subtract it from 25h 23m.0; and the remainder is the hour-angle of Polaris.

With this hour-angle take out the correction from Table IV (below), and add it to or subtract it from the true altitude, according to its sign. The result is the approximate latitude of the place.

Example.—1900, October 1, at 10h 40m 30s, P. M., mean solar time, in longitude 29° east of Greenwich, suppose the true altitude of Polaris to be 43° 20′: required the latitude of the place.

	h	m	s
Local astronomical mean time	10	40	30
Reduction from Table III, for 10h 40m 30s	+	1	45
Greenwich sidereal time of mean noon, October 1, page 165 .	12	39	3
Reduction from Table III, for longitude (= 1h 56m east, or minus)	—	0	19
Sum (having regard to signs) is equal to local sidereal time .	23	20	59
	h	m	s
	25	23	0
Subtract sidereal time	23	20	59
Remainder is equal to hour-angle of Polaris . . .	2	2	1

		°	′
True altitude . . .	+	43	20
Correction from Table IV (below)	—	1	3
Approximate latitude . .	+	42	17

TABLE IV—1900.

Hour-Angle.	0h.		1h.		2h.		3h.		4h.		5h.	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	−1 13.6	0.0	−1 11.0	0.4	−1 3.5	0.8	−0 51.6	1.2	−0 36.2	1.4	−0 18.4	1.5
5	1 13.6	0.1	1 10.6	0.5	1 2.7	0.9	0 50.4	1.2	0 34.8	1.4	0 16.9	1.6
10	1 13.5	0.1	1 10.1	0.5	1 1.8	0.9	0 49.2	1.2	0 33.4	1.4	0 15.3	1.6
15	1 13.4	0.1	1 9.6	0.6	1 0.9	0.9	0 48.0	1.2	0 32.0	1.5	0 13.7	1.6
20	−1 13.3	0.1	−1 9.0	0.6	−1 0.0	1.0	−0 46.8	1.3	−0 30.5	1.5	−0 12.1	1.6
25	1 13.2	0.2	1 8.4	0.6	0 59.0	1.0	0 45.5	1.3	0 29.0	1.5	0 10.5	1.6
30	1 13.0	0.2	1 7.8	0.6	0 58.0	1.0	0 44.2	1.3	0 27.5	1.5	0 8.9	1.6
35	1 12.8	0.3	1 7.2	0.7	0 57.0	1.0	0 42.9	1.3	0 26.0	1.5	0 7.3	1.6
40	−1 12.5	0.3	−1 6.5	0.7	−0 56.0	1.1	−0 41.6	1.3	−0 24.5	1.5	−0 5.7	1.6
45	1 12.2	0.4	1 5.8	0.7	0 54.9	1.1	0 40.3	1.3	0 23.0	1.5	0 4.1	1.6
50	1 11.8	0.4	1 5.1	0.8	0 53.8	1.1	0 39.0	1.4	0 21.5	1.5	0 2.5	1.6
55	1 11.4	0.4	1 4.3	0.8	0 52.7	1.1	0 37.6	1.4	0 20.0	1.6	−0 0.9	1.7
60	−1 11.0		−1 3.5		−0 51.6		−0 36.2		−0 18.4		+0 0.8	

Hour-Angle.	6h.		7h.		8h.		9h.		10h.		11h.	
m	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′	° ′	′
0	+0 0.8	1.6	+0 19.8	1.6	+0 37.4	1.4	+0 52.4	1.1	+1 3.9	0.8	+1 11.2	0.4
5	0 2.4	1.6	0 21.4	1.5	0 38.8	1.3	0 53.5	1.1	1 4.7	0.7	1 11.6	0.4
10	0 4.0	1.6	0 22.9	1.5	0 40.1	1.3	0 54.6	1.1	1 5.4	0.7	1 12.0	0.3
15	0 5.6	1.6	0 24.4	1.5	0 41.4	1.3	0 55.7	1.0	1 6.1	0.7	1 12.3	0.3
20	+0 7.2	1.6	+0 25.9	1.5	+0 42.7	1.3	+0 56.7	1.0	+1 6.8	0.7	+1 12.6	0.2
25	0 8.8	1.6	0 27.4	1.5	0 44.0	1.3	0 57.7	1.0	1 7.5	0.6	1 12.8	0.2
30	0 10.4	1.6	0 28.9	1.4	0 45.3	1.3	0 58.7	1.0	1 8.1	0.6	1 13.0	0.2
35	0 12.0	1.6	0 30.3	1.4	0 46.6	1.2	0 59.7	0.9	1 8.7	0.5	1 13.2	0.1
40	+0 13.6	1.6	+0 31.7	1.4	+0 47.8	1.2	+1 0.6	0.9	+1 9.2	0.5	+1 13.3	0.1
45	0 15.2	1.6	0 33.1	1.5	0 49.0	1.2	1 1.5	0.9	1 9.7	0.5	1 13.4	0.1
50	0 16.8	1.5	0 34.6	1.4	0 50.2	1.1	1 2.4	0.8	1 10.2	0.5	1 13.5	0.1
55	0 18.3	1.5	0 36.0	1.4	0 51.3	1.1	1 3.2	0.7	1 10.7	0.5	1 13.6	0.0
60	+0 19.8		+0 37.4		+0 52.4		+1 3.9		+1 11.2		+1 13.6	

cos. of 165° = cos of 75°

Colog = 10 − log

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